RAW WATER LINE REPLACEMENT PROJECT
BUILDINGS 18C AND 18E
AREA B
WRIGHT - PATTERSON AIR FORCE BASE

Wright-Patterson Air Force Base, Ohio

Project Number: 001868

January 2003

Engineering Division
88th Civil Engineer Directorate
Building 11, Area C

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SECTION 01010

SUMMARY

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work covered by these specifications consists of furnishing all labor, equipment, appliances, devices and materials, and performing all operations necessary in connection with Raw Water Line Replacement Project, Buildings 18C and 18E, Area B, Wright-Patterson Air Force base including removal of existing piping, installation of new piping system and miscellaneous work as herein specified and as shown, indicated, or noted on the drawings.

B. The work shall conform to the drawings listed in the following schedule.

SCHEDULE OF DRAWINGS

Number	Sheet	Designation	Date	Rev Date
T-1	1 of 7	Title Sheet	7/2002	1/2003
M-1	2 of 7	Demolition Plan, Building C	7/2002	
M-2	3 of 7	Demolition Plan, Building E	7/2002	1/2003
M-3	4 of 7	New Construction Plan, Building 18C	7/2002	
M-4	5 of 7	New Construction Plan, Building 18E	7/2002	
M-5	6 of 7	Isometric Details	7/2002	1/2003
M-6	7 of 7	Isometric Details	7/2002	

1.02 LOCATION

A. The site of the work is Buildings 18C and 18E in Area B of Wright-Patterson Air Force Base, Ohio.

1.03 GOVERNMENT FURNISHED PROPERTY

A. None

1.04 REMOVALS AND SALVAGE

A. Remove and dismantle all items which are shown to be removed or which must be removed to complete the work.

B. All materials, equipment, and debris resulting from this work and not designated for reuse in new work nor designated to be salvaged for the Government, will become the property of the contractor and shall be removed from the work site as it accumulates.

C. The contractor shall properly dispose of removed materials outside Wright-Patterson Air Force Base.

1.05 INSTRUCTIONS TO THE CONTRACTOR

A. The superintendent in charge of this work shall personally contact the user and the Engineering Division, Engineering Support Branch, Building 11, Area C, 88 ABW/CECM and Contract

Administration, Administrative Contracting Officer, hereafter referred to as ACO or Contracting Officer, ASC/PKWOEA, 257-4844, a minimum of 72 hours before starting site operations of the contract, before resumption of seasonal work, before restarting work after a lengthy delay, and prior to moving men and equipment from one site of work to another.

B. Work areas to remain occupied by Government personnel are shown on the plans.

C. The display of signs of a commercial nature within the boundaries of the installation will not be permitted. In no event will the contractor be permitted to use the government installation for the resale of surplus, structures, other improvements, or related equipment.

END OF SECTION

SECTION 01015

PROJECT GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Submittals (para 1.02).

B. Coordination and scheduling requirements (para 1.03).

C. Protection of personnel and Government property (para 1.04).

D. Requirements for fire protection, welding and cutting (para 1.05).

E. Construction facilities and job site standards (para 1.06).

F. Utilities (para 1.07).

G. Temporary construction controls (para 1.08).

H. Definitions (para 1.09).

I. Acronyms and Abbreviations (para 1.10).

J. Applicable Publications (para 1.11).

K. Materials and Equipment (para 1.12).

L. Testing (para 1.13).

M. Cleaning Requirements (para 1.14).

N. Project Close-out (para 1.15).

O. Safety Requirements (para 1.16).

P. Warranty service (para 1.17).

Q. The requirements of this section apply to the entire project including all addenda or change orders which may be issued to modify the contract documents.

R. Due to the general nature of this section, paragraphs may exist which are not applicable to any required work. In general, every provision of this section applies to all of the work that the provision could conceivably relate.

1.02 SUBMITTALS

A. Project schedule as specified in paragraph 1.03.D.1.

B. Site layout plan as specified in paragraph 1.03.D.3.

C. Project close out certification as specified in paragraph 1.16.A.

D. Project record drawings as specified in paragraph 1.16.B.

1.03 COORDINATION AND SCHEDULING REQUIREMENTS

A. The Contractor shall visit the premises to thoroughly familiarize himself with all details of the work and working conditions, check and verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancies before performing any work. The Contractor shall be specifically responsible for the coordination and proper relation of all the work for the entire project and the work of all trades, and for the neat appearance, correct fitting, required quantities, etc., of all work in this project.

B. Coordinate all construction activities with:

1. Project Inspector
2. Contracting Officer
3. Base Fire Department, 937-257-6933
4. Security Police, 937-257-4903

C. The Engineering Division, 88 ABW/CEC, Wright-Patterson Air Force Base, (Building 11, Area C) Ohio, is hereby designated as the representative of the Contracting Officer and its responsibilities include but are not necessarily limited to the following:

1. Technical review of shop drawings, catalog cuts, and technical data for all material and equipment requiring approval.

2. Periodic inspection and final acceptance of the work under the contract.

3. Verifying that progress is maintained in accordance with the contractor's approved progress schedule.

4. Verifying that contractor is accomplishing work in conformance with contract requirements.

D. Prior to the start of any construction operations, a schedule of work or operations in proper sequence shall be submitted by the contractor for approval by the Fire Protection Branch, Security Police, Safety Office, and the Contracting Officer so as to cause a minimum amount of disruption to the normal flow of traffic on streets, pedestrian travel, base security, and facility operations.

1. Submit to the Contracting Officer, who will submit to 88 ABW/CECM or CECP or CECW for approval, a project schedule detailing on a weekly basis when work is to begin for each work area and what work is to be accomplished (including quantities), etc. While factors not under the contractor's control may cause the contractor to fall behind the schedule, the intent of the schedule is to inform base personnel of planned orderly progression of the work in proper sequence. Once the schedule is approved, do not deviate from the sequence, without prior approval.

2. The Government retains the right to limit the number and location of all material storage, construction and office trailers, temporary structures of any kind and open storage and staging areas requested by the contractor to support this project. The contractor shall be responsible to submit a site layout plan identifying number, purpose, proposed location and certification of compliance with section 01015, paragraph 1.07.B of any and all material storage, office and construction trailers and temporary structures required for

accomplishment of this project. The plan shall also identify any and all required open storage and staging areas. This plan must be submitted to 88 ABW/CEC for review and approval a minimum of two weeks prior to mobilization

E. Before starting any work whereby traffic will be impeded or hindered, especially fire trucks and police vehicles, call and notify the Fire Protection Branch (extension 76933) and the Police Department (extension 76959 or 24 hour service 76516) 72 hours prior to placing barricades or starting any work. Under no circumstances place any barricades or start work until after the Fire Protection Branch and Police Department have been notified and have approved the barricading of work areas.

F. On site working hours for the contractor will be Monday through Friday between the hours of 7:30 a.m. and 5:00 p.m. unless otherwise noted. No on site work shall be performed on Saturdays, Sundays, and Federal holidays unless otherwise stated or shown. If the contractor wishes to work during periods other than above, permission must be requested from the contracting officer at least 48 hours in advance of his desire to work during these periods.

G. Perform all demolition operations on BASE between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, except holidays. Movement of heavy or slow equipment within the BASE or work area before 8:30 a.m. and after 4:00 p.m. is prohibited.

1.04 PROTECTION OF PERSONNEL AND GOVERNMENT PROPERTY

A. Areas requiring protection shall include the following:

1. Actual Construction Site - Area or areas within the work limits.

2. Storage Areas - Area or areas used for the storage of materials, devices, appliances and equipment to be used in the work.

3. Office and Shed Areas - Area or areas for placing or setting of temporary field office, tool sheds or storage sheds.

B. The contractor shall conduct his work so that all property to remain and all personnel, shall be protected at all times from damage of any nature and from injury resulting from this work until completion of the contract.

C. The contractor shall furnish and spread dropcloths in the work areas as necessary to protect surfaces. The contractor shall take precautions to protect the Government's equipment from dirt, dust, debris and falling piping, etc. The contractor shall remove all protective covering from the Government's equipment at the end of each work day to allow the Government to conduct its research.

D. In the event of damages of any nature caused by this work due to improper protection, precaution or safety measures, such damages shall be repaired or such property shall be replaced by the contractor at no cost to the Government. In the event the contractor does not satisfactorily repair or replace such damage caused by the work of this contract, the Government will make the necessary corrections and the contractor shall reimburse the Government for inconveniences, labor, and materials, involved.

E. The contractor shall furnish, place and maintain all required barricades as specified and as directed by the Safety Office and the Contracting Officer. Access drives and doors shall remain clear at all times.

F. Provide temporary, insulated enclosures of openings in exterior surfaces of interior spaces to provide acceptable working conditions and protection of materials and property, to allow for temporary space conditioning, and to prevent entry of unauthorized persons. Maintain all existing exits unless shown otherwise.

G. Erect and maintain dustproof partitions as required to prevent the spread of dust and dirt to parts of the building near work areas. On completion, remove partitions and repair damaged surfaces to match adjacent surfaces.

H. Contractor shall be responsible for proper application of weather sensitive materials and shall not apply any such materials when weather conditions fall below the minimum recommended by the material manufacturer.

I. Contractor shall maintain 50 degrees F minimum temperature throughout unoccupied interior portions of buildings under construction. Contractor shall maintain 65 degrees F minimum temperatures throughout occupied portions of buildings undergoing construction or alteration. This requirement shall apply also in the event that available heating supplied by the building heating system is rendered inadequate during the course of construction to maintain the above temperature. All costs incurred by the Government resulting from the Contractors failure to maintain the above temperatures shall be reimbursed by the Contractor to the Government.

J. It shall be the responsibility of the Contractor with assistance from BASE personnel to locate all existing utility lines in the field before starting excavation of any kind. Contractor shall process an AF Form 103, Base Civil Engineering Work Clearance Request. Contractor shall notify the inspector 72 hours in advance to schedule an on-site clearance.

K. Damages of any nature caused by this work shall be repaired or damaged property replaced at no expense to the Government. If the Contractor does not satisfactorily repair or replace the damaged property, the Government reserves the right to make the necessary corrections. The Contractor shall reimburse the Government for consequential damages and for all materials and labor used for the corrections.

1.05 FIRE PROTECTION, WELDING AND CUTTING REQUIREMENTS

A. First Aid Fire Protection

1. Portable fire extinguishers shall be provided where needed and inspected and maintained in accordance with NFPA 10, Portable Fire Extinguishers.

2. Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

3. Fire barrels and buckets shall be painted red and marked "For Fire Only". Barrels shall be kept filled at all times. Anti-freeze protection shall be provided when necessary. Each barrel shall be provided with at least two fire buckets.

4. Approved fire blankets shall be provided and kept in conspicuous and accessible locations as warranted by the operations involved.

5. A fire extinguisher rated not less than 2-A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

6. One or more fire extinguishers, rated not less than 2-A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to each stairway.

7. A fire extinguisher, rated not less 10B shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the worksite. This requirement does not apply to the integral fuel tanks of motor vehicles.

8. At least one portable fire extinguisher having a rating of not less than 20-B units shall be located outside of but not more than 10 feet from the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

9. At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet from any flammable liquid storage area located outside.

10. Fire extinguisher equipment shall be provided in storage areas according to the hazard present.

11. Fire extinguishers listed or approved by a nationally recognized testing laboratory shall be used.

12. No fire shall be fought where there is imminent danger of contact with explosives. All persons shall be removed to a safe area and the fire area guarded against intruders.

13. A fire extinguisher rated not less than 2-A shall be provided where melting pots, torches, or open flames are in use.

14. A ½-inch diameter garden hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2-A rated fire extinguisher, provided it is capable of discharging a minimum of 5 gallons per minute with minimum hose stream range of 30 feet horizontally. The garden hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be supplied to all points in the area.

B. Fire Patrols

1. When watchmen or guards are provided, they shall make frequent rounds through buildings and storage areas when work is suspended.

2. In any instance where combustible materials have been exposed to fire hazards, such as welding operations, hot metals, or open flame, a watcher shall be assigned to remain at the location for at least one hour after the exposure has ended.

C. Water Supply and Distribution

1. Where a water distribution system is required for the protection of buildings or other structures, water mains and hydrants shall be installed prior to or concurrently with the construction of the facilities.

2. Vehicles, equipment, materials, and supplies shall not be placed so that access to fire hydrants and other fire fighting equipment is obstructed.

3. For demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only when approved by the Contracting Officer.

D. Fire Alarm Devices

1. An alarm system shall be established by the contractor whereby workers on the site and the local fire department will be alerted in the event of an emergency.

2. The alarm code and reporting instructions shall be conspicuously posted at phones and at worker entrances.

E. Welding and Cutting General

1. All welding and cutting equipment and operations shall be in accordance with standards and recommended practices of the American Welding Society, Safety in Welding and Cutting, ANSI 749.1, and the recommendations of the National Fire Protection Association.

2. Transformer-type electric welding apparatus shall be installed, maintained and operated in accordance with the National Electrical Code.

3. Gas, welding and cutting equipment shall be listed by Underwriters' Laboratories, Inc. Chicago, Illinois or by Factory Mutual Laboratories, Boston, Mass.

4. All welding equipment shall be inspected daily. Defective equipment shall be removed from service, replaced, or repaired and reinspected before again being placed in service.

5. Each welding or cutting unit shall be equipped with a compatible fire extinguisher.

6. Compatible fire extinguishing equipment shall be provided in the immediate vicinity of the welding or torch operation whenever combustible material is exposed.

7. Objects to be welded, cut or heated shall be moved to a safe location or, if they cannot be moved, all movable fire hazards in the vicinity shall be taken to a safe place or the combustible material and construction shall be protected from the heat, sparks, and slag of welding.

8. Workers and the public shall be shielded from welding rays, flashes, sparks, molten metal, and slag.

9. Cable, hoses, and other equipment shall be kept clear of passageways, ladders, and stairways.

10. All hollow spaces, cavities, or containers shall be vented to permit the escape of air or gases before preheating, cutting, or welding. Department of Transportation, Office of Pipeline Safety, 49 CFR Part 192, Minimum Federal Standards for Gas Pipelines, shall apply when welding, cutting, and heating on steel pipelines containing natural gas. Pipelines containing gases or flammable liquids or conduits containing electrical conductors shall not be used as a ground return.

11. When welding or cutting must be done in a location where combustible or flammable materials are located, inspection and written authorization by the Contracting Officer shall be required before such operations are begun. The location shall be checked for latent fires after the work is completed.

12. Cylinders shall be kept beyond the range of sparks, hot slag, or flame.

13. Positive mechanical and/or personal protective measures shall be taken when welding, cutting, or heating metals of toxic significance in enclosed spaces.

14. Oxygen shall not be used for ventilation, comfort cooling, blowing dust from clothing, or for cleaning the work area.

15. Before welding, cutting, or heating is commenced on any surface covered by a preservation coating whose flammability is not known, a test shall be made to determine its flammability. Preservation coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

16. Precautions shall be taken to prevent ignition of highly flammable hardened preservation coatings. When coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.

17. In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application or the employees shall be protected by air line respirators.

18. In the open air, workers shall be protected against toxic preservation coatings by a respirator that meets the requirements of NIOSH.

19. Preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised.

20. When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire and instructed in anticipated fire hazards and how fire fighting equipment is to be used.

21. Hose which has been subject to flashback, or which shows severe wear or damage, shall be tested to twice the normal pressure to which it is subject but in no case less than 300 psi. Defective hose, or hose in doubtful condition, shall not be used.

22. No welding, cutting, or heating shall be done where the application of flammable paints, or the presence of other flammable compounds, or heavy dust concentrations creates a hazard.

23. Noncombustible barriers shall be installed below welding or burning operations in or over a shaft.

24. When welding, cutting, or heating is performed on walls, floors and ceilings, the same precautions shall be taken on the opposite side as are taken on the side on which the welding is being performed.

25. All structural welding accomplished by the contractor on critical items such as scaffolding, shoring, forms, ladders, piling, etc., shall be performed by currently certified welders using

qualified welding procedures. The contractor shall provide copies of the welders certificate to the Contracting Officer.

F. Gas Equipment

1. Torch valves shall be closed and gas supply shut off whenever work is suspended.

2. The torch and hose shall be removed from confined spaces whenever work is suspended.

3. All oxyacetylene or other fuel gas-oxygen combinations used in cutting or welding equipment shall have reverse-flow check valves mounted at the tank end of the hose. Manifold systems shall have the reverse-flow valves installed at the manifold connections.

4. Boxes used for the storage of gas hose shall be ventilated.

5. Acetylene regulators shall not be adjusted to permit a discharge pressure greater than 15 psig.

6. Connection of multiple sets of oxyacetylene hoses to a single regulator on a single set of oxyacetylene tanks may only be accomplished by installing a commercially available fitting approved by Compressed Gas Association (CGA) Standards and UL listed. The fitting shall be installed on the output side of the regulator and shall have a built-in shut-off valve and reverse-flow check valve on each branch.

G. Electric Equipment

1. Switching equipment for shutting down the welding machine shall be provided on or near the welding machine.

2. The noncurrent carrying metal parts of electrically powered welding machines shall be grounded. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the equipment to be grounded has resistance low enough to permit sufficient current to flow to cause the overcurrent device to interrupt the circuit.

3. Neither terminal of the welding generator shall be bonded to the frame of the welder.

4. Pipe lines containing gases or flammable liquids or conduits carrying electrical conductors shall not be used for a ground return circuit.

5. The equipment shall be shut down when the leads are unattended.

6. Cables with splices or repaired insulation within 10 feet of the holder shall not be used.

7. Welding leads shall not be placed near power supply cables or other high-tension wires.

8. Welding leads shall not be permitted to contact metal parts supporting suspended scaffolds.

9. Circuits from welding machines used for other than welding tools shall be grounded.

H. Inert-Gas Metal-Arc Welding

1. Chlorinated solvents shall be kept at least 200 feet unless shielded, from the exposed arc. Surfaces prepared with chlorinated solvents shall be dry before welding is permitted on such surfaces.

2. Persons in the area not protected from the arc by screening shall be protected by filter lenses. When two or more welders are exposed to each other's arc, filter lens goggles shall be worn under welding helmets. Hand shields to protect the welders against flashes and radiant energy shall be used when either the helmet is lifted or the shield is removed.

3. Welders and other persons who are exposed to radiation shall be protected so that the skin is covered to prevent burns and other damage by ultraviolet rays. Welding helmets and shields shall be free of leaks, openings, and highly reflective surfaces.

4. When inert-gas metal-arc welding is performed on stainless steel, persons will be protected against dangerous concentrations of nitrogen dioxide by local exhaust ventilation or air line respirators.

1.06 CONSTRUCTION FACILITIES AND JOB SITE STANDARDS

A. The contractor shall be responsible for the storage and safekeeping of all material to be incorporated into the work. The contractor shall be responsible for all aspects of safety and security within the storage area.

B. If required the contractor may provide, but must minimize, material storage, construction and office trailers, temporary structures of any kind to support this project. The Government retains the right to limit the number and location of these facilities; if such facilities are required they must meet the following standards.

1. Facilities shall meet Air Force and Base fire regulations and be inspected and approved by the Fire Protection Branch.

2. The facilities must be sited and approved as required in section 01015, paragraph 1.03.D.3. The final approved site for these facilities will not necessarily be adjacent to the project.

3. The facilities shall be clean, in good condition, undamaged and free of rust or surface deterioration’s. Rental trailers shall be of a neutral color. Unsightly material storage or office trailers will not be permitted. (Trailers owned by the contractor or subcontractors which are other than a neutral color will be considered if identified and described in the job site plan required in section 01015; paragraph 1.03.D.3; and provided they meet all other standards required herein.)

4. The contractor shall be responsible to maintain the condition of these facilities, as defined above, and the entire construction site in a neat, orderly, professional and uncluttered manner at all times throughout the length of the contract. Daily site appearance, including control of debris, open storage of materials, shall conform to section 01015, paragraph 1.15.

5. All facilities shall have a professionally made metal identification sign attached in a prominent location. The sign shall be 2’ x 3’ in size (with light colored lettering on a dark colored background) indicating the contractor name, name and 24 hour phone number of someone to contact in case of emergency.

C. There shall be no storage of materials or equipment in other than the approved storage areas.

1.07 UTILITIES

A. Electrical, water and other utility demands required for performing the work which exceed what is readily available at the work areas shall be supplemented as necessary by the Contractor.

B. All connections to the Government water system, either through direct connection to piping or via fire hydrants, shall be equipped with a reduced pressure principle backflow device approved for use by the Ohio Environmental Protection Agency (EPA) for public water supply.

C. All utilities, including Cable TV, are to be maintained for the duration of the project. The contractor shall coordinate any requirement for temporary disconnecting of a utility for any period of time through the Contracting Officer.

D. Utility shutdowns for the purpose of disconnecting or connecting services which will affect areas outside the immediate project work area shall be accomplished after normal workday hours of the Base or on weekends.

E. To effect a utility shutdown the contractor shall submit a request in writing a minimum of 336 hours (14 work days) in advance of necessity for such shutdown. The request shall contain the following:

1. Name of Contractor
2. Requested Date and Time for Shutdown
3. Duration of Shutdown
4. Buildings or Parts of Buildings Affected
5. Utilities Affected

F. Contractor shall not effect a shutdown until all approvals have been obtained and until a signed AF Form 103, Base Civil Engineering Work Clearance Request has been issued.

1.08 TEMPORARY CONSTRUCTION CONTROLS

A. Controlled entry into an occupied work area designated as a controlled area shall be maintained throughout the duration of construction. A sign in desk, if required by the agency using the work area, shall be in operation and its location and relocation during construction shall be closely coordinated with the Contracting Officer and the heads of the departments affected by the work. The sign in desk will be provided and manned by the Government.

1.09 DEFINITIONS

A. "Provide" is defined as "furnish new, install, and make operational".

B. "Replace" is defined as "remove existing and provide new in same location and make operational".

C. "Relocate" is defined as "remove existing, install existing in different location, and make operational".

D. "Reinstall" is defined as "remove existing, install existing in same location and make operational".

E. "Extend" is defined as "provide new from existing to designated equipment or location and make operational".

F. "Reroute" is defined as "remove existing and provide new in the designated location and make operational".

G. "Coordinate" is defined as "the Contractor shall inform and achieve concurrence with the designated party or parties".

1.10 ACRONYMS AND ABBREVIATIONS

A. Acronyms and abbreviations that are used in these specifications may be defined in the text of the specification by placing the acronym or abbreviation inside parentheses immediately following the full name of the item referenced by the acronym or abbreviation. The defined acronym or abbreviation may then be used alone to refer to the item named in the definition.

1.11 APPLICABLE PUBLICATIONS

A. Various references are listed throughout these specifications under the heading of Applicable Publications. Such publications are incorporated into these specifications by reference. Materials and installation shall conform to the requirements of the specified applicable publications. The edition of each publication to apply shall be the most recent edition published prior to the date of bid opening.

B. The contractor shall insure that all work performed is in full compliance with all federal, state and local laws and ordinances applicable to the construction of or the finished product of this construction contract.

1.12 MATERIALS AND EQUIPMENT

A. All materials to be incorporated into the work shall conform to the contract requirements and shall be kept clean and dry prior to installation. No damaged or rusted materials may be incorporated into the work.

B. Deliver, store and handle all items to be incorporated into the work in strict conformance to the manufacturers written recommendations.

C. All materials shall be labeled to show the manufacturer and product name and number.

D. Provide duplicates by one manufacturer where two or more pieces of material or equipment perform identical functions.

E. Material and equipment shall be standard products of the manufacturer's latest design and available to perform the functions intended.

F. Inspect all materials and equipment upon receipt and again immediately prior to installation. Do not install anything showing evidence of damage or defect. Discard such items and replace with new.

G. Install all materials and equipment in strict conformance to the manufacturers written instructions and recommendations.

H. Install listed or labeled equipment in strict conformance to all conditions of listing or labeling.

1.13 TESTING

A. Unless otherwise indicated, the contractor shall be responsible for providing and arranging all required samples and tests specified in these documents. Each test shall be performed in accordance

with these specifications and accomplished by professional testing firms experienced in conducting those required tests.

B. Notify the Government inspector in writing at least two days in advance of all tests.

C. All sampling and testing shall be repeated until acceptable results have been achieved. All samples and tests producing unacceptable results shall be the responsibility of the contractor and shall not result in any additional cost to the Government.

D. A minimum of 5 typewritten copies of all test data shall be submitted to the Contracting Officer for review and approval. All pertinent data and a summary of the test results shall be submitted by the testing firm performing each test with an affidavit stating that the material has been sampled and tested in accordance with the specifications and that the sample has either failed, meets, or exceeds all requirements as specified.

1.14 CLEANING REQUIREMENTS

A. Use only cleaning materials and equipment compatible with surfaces being cleaned as recommended by manufacturers.

B. Remove all scrap and debris from the job site daily.

C. Maintain job site in an orderly condition.

1. Allow maximum access.

2. Do not impede traffic.

3. Protect materials and equipment.

4. Site must be maintained in a neat, orderly, professional and uncluttered manner at all times including control of debris, open storage of materials, weed and grass control and all temporary facilities, equipment, tools and vehicles.

D. Sweep interior job site spaces free from dust and other material capable of being removed by reasonable diligence using a hand-held broom daily.

E. Place cloths, and cotton waste that constitute a fire hazard in closed metal containers daily or remove them from the site.

F. Remove graffiti daily.

G. All wastes shall be removed from the job site daily or placed in the contractors' approved containers daily and removed from the job site at least once each week.

H. Properly dispose of all wastes outside of Wright-Patterson Air Force Base. In no case shall construction waste be placed in Government waste containers.

I. Keep finished floors free from all foreign material.

J. At completion of work, clean the job site as follows:

1. Remove tools, surplus materials, surplus equipment, scrap, debris, and waste material.

2. Visually inspect surfaces and remove soil, waste material, smudges, and other foreign material.

3. Remove splashed material from surfaces.

4. Remove paint droppings, spots, stains, and dirt from finished surfaces.

5. Sweep interior job site free from dust and other material.

K. Construction office and storage areas shall be kept clean and orderly at all times.

1.15 PROJECT CLOSEOUT

A. When the contractor considers work is complete, written certification shall be submitted by the contractor that:

1. Contract documents have been thoroughly reviewed by the contractor.

2. Work has been thoroughly inspected by the contractor for compliance with all contract requirements.

3. Deficiencies listed from all previous inspections have been corrected.

4. Equipment and systems have been adjusted as specified and have been demonstrated in the presence of the Contracting Officer or his representative and are operational.

5. Final cleaning has been accomplished.

6. All required submittals have been approved.

7. Work is complete and is ready for final inspection.

B. Submit project record documents together with closeout certification.

C. Within 5 days of receipt of the certification, the Contracting Officer will perform the final inspection and notify the contractor in writing of incomplete or defective work.

D. If deficiencies exist, the contractor shall remedy them and send a second notice of completion and the work will be reinspected.

1.16 SAFETY REQUIREMENTS

A. Comply with all AFOSH and OSHA requirements.

1.17 CONSTRUCTION AND WARRANTY SERVICE

A. The contractor shall be required to respond to requests from the Contracting Officer or authorized representative to correct deficiencies identified under the warranty provisions of the contract. These requests shall generally be made during normal working hours (8 AM-5 PM, Monday through Friday). However, requests may be made during other times including weekends, nights and holidays. The Contractor shall provide to the Contracting Officer, and keep current at all times, the names of responsible individuals to whom warranty problems can be referred.

B. The contractor shall provide a 24 hour, 7 day a week response to any problem encountered during construction and warranty period.

C. The contractor shall respond and correct deficiencies within the following time periods.

1. Emergency Service Calls - Respond within 2 hours of notification; stay on the job until the problem is corrected.

2. Urgent Service Calls - Respond within 24 hours, correct the problem within 5 days of original notification.

3. Routine Service Calls - Respond within 72 hours, correct the problem within 5 days of original notification.

D. The Contracting Officer or his representative will make the determination of whether a deficiency is an emergency, urgent, or routine.

1. Typical emergency deficiencies include:

a. Broken water service

2. Typical urgent deficiencies include:

a. Any defect that prohibits the occupant from using any portion of a product or facility but does not threaten their safety or welfare

END OF SECTION

SECTION 01020

GENERAL ENVIRONMENTAL PROTECTION REQUIREMENTS
(1/02)

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Protection of land resources.

B. Protection of natural water resources.

C. Prevention of air pollution.

D. Disposal of solid waste and recycling.

E. Management of hazardous materials and hazardous waste.

F. Affirmative Procurement of recycled content products.

1.02 RELATED WORK

A. Nothing in this specification section shall relieve the contractor of any other environmental protection requirement specified in federal, state or local laws and regulations.

B. Other specification sections may cite environmental protection requirements in addition to those specified herein. This may include specification of requirements for asbestos abatement, removal of paint containing lead, removal of items containing polychlorinated biphenyl (PCB) compounds, removal of lamps containing mercury, Ozone Depleting Substance (ODS) Recovery and other requirements.

1.03 APPLICABLE PUBLICATIONS

A. U. S. Environmental Protection Agency (EPA) Publications.

1. Title 40 of the Code of Federal Regulations (40 CFR), Protection of Environment [http://www.epa.gov/epahome/rules.html].

2. Title III List of Lists: Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act, as Amended [http://www.epa.gov/swercepp/ap-otgu.htm].

B. U. S. Occupational Safety and Health Administration (OSHA) Publications.

1. Title 29 of the Code of Federal Regulations (29 CFR) [http://www.osha.gov/comp-links.html].

C. U. S. Department of Transportation (DOT) Publications.

1. Title 49 of the Code of Federal Regulations (49 CFR), Section 172.101, Hazardous Material Table [http://hazmat.dot.gov/rules.htm].

D. Wright-Patterson Air Force Base, Office of Environmental Management Publications [http://www.abwem.wpafb.af.mil/em/].

1. Hazardous Material Management Plan.
2. Hazardous Waste Management Plan.
3. Pollution Prevention Management Plan.

E. State of Ohio Publications.

1. Ohio Administrative Code, Chapter 3745, Environmental Protection Agency.

1.04 SUBMITTALS

A. Identification of contractor's environmental coordinator and alternate. See part 3.01, Contractor's Environmental Coordinator, paragraph B.

B. Storm Water Pollution Plan. See part 3.04, Protection of Water Resources, paragraph B.

C. Ohio EPA form "Notification of Demolition and Renovation." See part 3.05, Prevention of Air Pollution, paragraph A.

D. Recycling and solid waste summary report. See part 3.07, Solid Waste and Recycling, paragraph D.

E. Site Specific Spill Plan. See part 3.08, Spill Prevention, Control, and Reporting, paragraph A.

F. Contractor Hazardous Material Notification (WPAFB Form 1414). See part 3.09, Hazardous Materials Management, paragraph B.

G. Request for approval of Hazardous Material Issue Point. See part 3.09, Hazardous Materials Management, paragraph C.

H. Hazardous Waste Storage Permit application. See part 3.10, Hazardous Waste Management, paragraph B.

I. A current Resource Conservation and Recovery Act training certificate for the hazardous waste site manager. See part 3.10, Hazardous Waste Management paragraph B.

J. Hazard Communication Plan. See part 3.09, Hazardous Material paragraph B.

1.05 DEFINITIONS

A. Hazardous Material (HM): Any chemical, substance or material in any quantity or volume as defined by the Occupational Safety and Health Administration in 29 CFR 1910.1200, the Environmental Protection Agency in 40 CFR Parts 302 and 261, and the Department of Transportation in 49 CFR Part 172.

B. Hazardous Waste (HW): Wastes which are listed by chemical name in 40 CFR 261 Subpart D, and/or exhibit one or more of the characteristics described in 40 CFR 261 Subpart C.

C. Initial Accumulation Point (IAP): Same as Satellite Accumulation Point.

D. Issue Point: A centralized location where HM is received, stored, transferred and issued.

E. Manifest or Uniform Hazardous Waste Manifest: EPA form 8700-22 and, if necessary, EPA form 8700-22A, originated and signed by the generator in accordance with the instructions included in the appendix to 40 CFR Part 262.

F. Material Safety Data Sheet (MSDS): A summary of safety, health, and emergency response information about a manufactured product obtained from the product manufacturer or distributor. The MSDS includes information about the chemical constituents, their hazards, and personal protective equipment to be used.

G. Satellite Accumulation Point (SAP): A permitted HW collection point at or near an area where HW is generated and used for the initial accumulation and storage of HW.

H. Special Waste: A waste as defined by 40 CFR Part 240.101 (Z). A non-hazardous solid waste requiring handling other than that normally used for municipal solid waste.

I. Universal Waste: A hazardous waste as defined by 40 CFR Part 260.10. Batteries, Pesticides and Thermostats, which are managed in accordance with the universal waste requirements promulgated in 40 CFR 273.

1.06 BASE ENVIRONMENTAL AUTHORITY.

A. The Office of Environmental Management—office symbol 88 ABW/EM—establishes environmental compliance policy, administers environmental programs, and coordinates environment protection requirements for Wright-Patterson Air Force Base. The 88 ABW/EM is the designated spokesperson for WPAFB and is the only office authorized to interface with environmental regulatory agencies.

PART 2 – PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CONTRACTOR'S ENVIRONMENTAL COORDINATOR.

A. The contractor shall designate one individual from his organization to serve as an environmental coordinator and a second individual to serve as an alternate for the environmental coordinator. Within 15 days after receipt of Notice to Proceed the contractor shall submit the names and telephone numbers of the designated environmental coordinator and alternate to the contract administrator.
The phone numbers shall include both the usual business telephone number and a 24-hour emergency telephone number where the individual can be reached at any time for an environmental emergency.

B. The contractor's environmental coordinator shall serve as a single, integrated point of contact to the contractor's organization for all environmental questions and requirements. This individual will be responsible for providing the contractor's response to all environmental requirements and must be authorized to direct the contractor's organization to respond to environment requirements.

C. For all contracts that have a performance period of 180 days or longer, the contractor's environmental coordinator and alternate shall attend the Installation Tier 2 HAZMAT / HAZWASTE Training course within 90-days after contract award. This course is a one-day, eight-

hour course that explains procedures and requirements for the management of hazardous materials and hazardous waste at Wright-Patterson AFB. Contact 88 ABW/EMY at 937-257-7152 to obtain the schedule of classes and to enroll. This course is not a replacement or substitute for any other training requirement specified by applicable laws or regulations. The contractor shall comply with all other applicable training requirements in addition to this requirement.

3.02 GENERAL REQUIREMENTS

A. Unless otherwise stated, the Contractor shall obtain all necessary environmental permits and licenses. The Contractor shall be responsible for payment of all permit fees. The Contractor shall comply with all terms and conditions of permits.

B. The contractor is responsible for having a competent person on site who is capable of identifying existing asbestos hazards in the workplace as specified in 29 CFR 1926.32(f). If the contractor encounters suspected asbestos containing materials not covered by the drawings or specifications the contractor shall immediately notify the contracting officer. Do not disturb any material that is suspected of containing asbestos until the contracting officer has determined the content of the material and the proper handling procedures, if required. All asbestos operations shall be accomplished in accordance with WPAFB specification 02081, “Removal and Disposal of Asbestos Containing Materials.”

C. The contractor shall maintain all equipment, facilities and structures used for pollution control under this contract. All of these items shall be maintained in good working condition for as long as they are needed to control pollution.

3.03 PROTECTION OF LAND RESOURCES

A. The Contractor shall confine all activities to areas designated by the contract drawings and specifications. Contractor shall be sure areas of work do not interfere with Installation Restoration Sites. These Sites are located on the Base Comprehensive Plan. Prior to the beginning of any exterior construction work the Contractor shall identify the land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without permission. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Stone, earth or other material displaced into uncleared areas shall be removed and the area restored.

B. All disturbed soil areas that previously supported vegetation, regardless of the type of vegetation, must be restored. If the area is to be seeded (not sodded), it must consist of perennial species (not annual) and the work must be started and completed during the time of year when seed would likely germinate which is spring (March through mid May) or fall (September through mid October). If seeding cannot be accomplished during these times, then a temporary cover (which could be a temporary cover crop such as rye or a mulch) shall be placed on the disturbed area to prevent erosion in the interim. Seeding and all necessary preparation of the site (cultivation) to make it conducive for seed germination shall be accomplished as soon as possible during the next acceptable time period."

3.04 PROTECTION OF WATER RESOURCES

A. The contractor shall not pollute streams, lakes, or rivers with chemicals, petroleum products, construction wastes, sewage, or other harmful materials. Provide such controls as may be necessary to prevent the discharge of any such pollutant into any body of water. All work under

this contract shall be performed in such a manner that objectionable conditions will not be created in any bodies of water or storm drainage structures that run through or adjacent to the project areas.

B. Before any soils are disturbed or exposed, the contractor shall submit a Stormwater Pollution Prevention Plan (SWP3) through the contract administrator to 88 ABW/EMY (Stormwater Program Manager) for review and approval. The SWP3 will show the contractor's scheme for controlling erosion at the job site, including a site plan showing the area(s) to be disturbed and the placement of erosion control structures. The plan shall state the total acreage of soils to be exposed, including soil stockpiles, and shall include adequate measures to:

1. Reduce by the greatest extent practicable the area and duration of exposure of bare soils.

2. Protect readily erodible soils by use of temporary vegetation, or seeding and mulch, or by accelerating the establishment of permanent vegetation.

3. Retard the rate of runoff from construction site.

4. Trap sediment resulting from construction using silt fences, straw bale structures, other inlet protection, and/or sediment ponds. This includes pump discharges resulting from dewatering operations. Include construction/installation details for sediment control structures.

5. Provide a schedule for inspection and maintenance of all erosion control measures including any time periods where construction operations are suspended for any reason.

C. The contractor shall utilize best management practices to ensure proper storage, handling, use and/or production of regulated substances to prevent their introduction into the ground water aquifer. Particular care must be exercised on projects which lie within WPAFB's and the City of Dayton's water well one-year capture zones. The exact locations of the one-year capture zones can be obtained from 88 ABW/EMY's Drinking Water Program Manager.

D. Any construction activity that will disturb 5 acres or more of land (NOTE: Effective 10 March 2003 the size will be reduced to one (1) acre of disturbed land) requires a National Pollution Discharge Elimination System Notice of Intent (NOI) issued by Ohio EPA through 88 ABW/EMY. Contact the 88ABW/EMY Storm Water Program Manager to obtain a copy of the NOI for this project which shall be on file on site.

1. In the event a NOI has not been obtained for this project the contractor shall prepare the following documents sixty (60) days prior to ground breaking (120 days for the 10 March 2003 date).

a. Prepare a Stormwater Pollution Prevention Plan (2 copies – 1 to be maintained on site) (Guidance Document - http://www.epa.state.oh.us/dsw/guidance/guidance.html)

b. Prepare a Notice of Intent (NOI)
   i. 8 1" x 11" drawing of excavation area including adjacent areas (4 copies)
   ii. $200.00 review fee (permit fee)

2. Thirty (30) days after final stabilization of site: Prepare a Notice of Termination (NOT) (Application form notifying Ohio EPA of termination of activity)

3. The items in Item 3.04 (D).1 and 2 are prepared by the contractor performing the project and submitted through the contract administrator to 88 ABW/EMY.

3.05 PREVENTION OF AIR POLLUTION

A. The contractor is responsible for filing an "Ohio Environmental Protection Agency Notification of Demolition and Renovation" with the Regional Air Pollution Control Agency (RAPCA) at least 10 working days prior to demolishing any structures or any load-bearing components within structures. The notification shall be submitted in accordance with section 02081, Removal and Disposal of Asbestos Containing Material through the contract administrator to 88 ABW/EMY for approval prior to filing it with RAPCA.

B. The contractor shall not cause or permit any fugitive dust that violates the opacity limits of OAC 3745-17-07 or 20% opacity as a three-minute average. Reasonably available control measures must be used to prevent fugitive dust from becoming airborne. Such measures shall include, but not be limited to, one or more of the following:

1. Use of water or other suitable dust suppression chemicals for demolition and construction operations and the clearing of land. If water is used, it must be reapplied at frequent intervals to keep all parts of the disturbed area at least damp at all times.

2. Use of adequate containment methods during sandblasting or other similar operations.

3. The periodic application of water or other suitable dust suppression chemicals or the use of canvas or other covering for all materials stockpiles, except temporary stockpiles on site for 30 days or less.

4. Covering at all times of open-bodied vehicles when transporting materials likely to become airborne.

5. Prompt removal, in such a manner as to minimize resuspension, of earth or other material from paved streets onto which earth or other materials has been deposited by trucking or earth moving equipment or erosion by water or other means.

C. No open burning of any construction waste and/or unsalvageable materials shall be allowed.

D. Recovery of Ozone Depleting Substances must be performed in accordance with specification SECTION 02091A.

3.06 CONTROL OF PCB COMPOUNDS

A. All work involving the handling of PCBs shall be performed in strict conformance to the requirements of the U.S. Environmental Protection Agency

B. No work shall be performed on or near transformers containing over one gallon of PCB type oil without daily clearance. The daily clearance shall be obtained as directed by the Contracting Officer. Servicing of PCB transformers that require the removal of the transformer coil from the transformer casing is prohibited. When rebuilding or servicing PCB transformers, dielectric fluids containing less than 2 parts per million of PCBs must be used. PCBs removed in servicing or rebuilding must be captured and disposed of in accordance with 40 CFR 761.70 or 761.75.

C. Work involving the removal and handling of PCB containing lamp ballasts shall be conducted in accordance with WPAFB specification SECTION 02083C, REMOVAL OF POLYCHLORINATED BIPHENYL FLUORESCENT LIGHT BALLASTS

3.07 SOLID WASTE AND RECYCLING

A. Litter shall be controlled and containerized at all times. Care will be exercised to insure that no litter is lost from any vehicle while in transit to or from the construction site.

B. All waste materials generated by this work shall be disposed of, by the contractor, outside the limits of Wright-Patterson Air Force Base, and in strict conformance with all applicable laws and regulations.

C. The contractor shall recycle as many construction and demolition waste types as is practicable, including piping, fittings, conduit, electrical wire, cast iron, other metals, and cardboard. Contact Wright-Patterson's Recycling Center at 257-4889 or the base Qualified Recycling Program Manager in 88 ABW/EMY at (937) 257-5535 for support in the contractors recycling efforts. If available the Recycling Center may supply containers for collection of any recyclables being turned in to the center.

D. At the end of the project the contractor shall submit a summary report through the contract administrator to 88 ABW/EM stating (1) the tonnage of construction and demolition materials recycled, (2) the tonnage of construction and demolition materials landfilled or otherwise disposed of, and (3) the approximate dollar amount that the contract was reduced through recycling.

E. The contractor shall manage all solid wastes and all special wastes in strict conformance with all applicable environmental laws, policies, regulations and procedures.

3.08 SPILL PREVENTION, CONTROL, AND REPORTING

A. Spill prevention is the responsibility of the contractor. The contractor shall develop a Site Specific Spill Plan (SSSP) for each storage location where hazardous materials (HM) or hazardous wastes (HW) are stored. See Appendix C of the Hazardous Material Management Plan or 88 ABW/EM's website for the SSSP standard format. Each SSSP shall be submitted through the contract administrator to 88 ABW/EMO for review and approval prior to bringing any HM onto Wright-Patterson AFB. The approved SSSP documents shall be posted at the HM/HW storage locations.

B. All contractor personnel must be familiar with the SSSP including what actions to take in the event of a spill, required notifications to be made, and where the contractor's spill containment equipment and materials are kept.

C. The contractor shall report all spills that occur in performing the work of the contract regardless of who is responsible for the spill. The spills shall be reported as follows, with the report made immediately following awareness of the spill and any emergency containment procedures:

1. Fuel and Oil Spills: Report all spills of more than one gallon of material. Report all spills of any size if the material enters a sewer. Report all spills of any size that create a fire hazard. Report these spills to the Base Fire Department by calling 911 and also notify the government's project inspector.

2. Spills of Hazardous Chemicals: Report all spills of any size to the Base Fire Department by calling 911 and also notify the government's project inspector.

3. Spills of Other Materials (such as paint, tar, etc.): Report all spills that enter sewers or that have the potential to damage or pollute the environment. Report these spills to the base Office of Environmental Management at 257-2201 and also notify the government's project inspector. After duty hours report these to the Base Fire Department by calling 911.

D. The contractor shall be responsible for containment of all spills. The contractor is responsible for maintaining spill containment equipment and materials on site that are appropriate for the materials being stored and in sufficient quantities to provide containment for the volume of material stored. However, if assistance is needed for containment or safety, the contractor shall immediately notify the Base Fire Department at 911. The Base Fire Department and the base Office of Environmental Management shall determine the amount of containment required. The contractor shall clean up all spills that result from the contractor's actions or activities, including faulty equipment. The cleanup methods shall be as required by or acceptable to the Contracting Officer or the Contracting Officer's technical representative. The contractor shall reimburse the Government for all materials and assistance provided by the Government and used in containment or cleanup of those spills resulting from the contractor's actions.

3.09 HAZARDOUS MATERIALS MANAGEMENT

A. Material Storage and Use: The contractor shall follow manufacturer's guidelines and professional recommendations for control of humidity, temperature, cleanliness and material handling relative to storage and use of all hazardous materials (HM). The contractor shall use, handle and store all HM in accordance with all federal, state, local and Air Force laws, policies, regulations and procedures as specified in, but not limited to, the WPAFB Hazardous Material Management Plan.

B. Notification Requirements:

1. Submit copy of the contractors Hazard Communication Program as required by 29 CFR 1910.1200.

2. The contractor shall submit a WPAFB Form 1414, Contractor Hazardous Material Notification, through the contract administrator to 88 ABW/EM's HAZMAT Cell at least 15 days prior to bringing any hazardous material (HM) onto WPAFB. The notification shall list the materials and corresponding Material Safety Data Sheet (MSDS) for each HM product to be stored on WPAFB for a period of greater than 24 hours. If more than two HM's are used as part of this task, a spreadsheet shall be attached to the WPAFB Form 1414 containing equivalent information. Inventories and MSDSs must be submitted through the contract administrator to 88 ABW/EM and updated as information changes.

3. The contractor shall report within ten (10) workdays in writing through the contract administrator to the 88 ABW/EM HAZMAT Cell when a HM container is empty and/or removed from the installation

C. Issue Point (IP): The contractor shall establish a centralized location to receive, store, transfer and issue HM when storage of HM is required for more than twenty-four (24) hours. The contractor must apply in writing through the contract administrator to 88 ABW/EMY for approval of the IP. The application must include the proposed IP location, description and maximum quantity of each HM to be stored, types and sizes of containers in which the HM will be stored, and the types and sizes of any containers into which HM may be transferred for issuance to workers. The contractor shall furnish all equipment necessary to manage HM. This equipment includes, but is not limited to, approved chemical security cabinets, locks, secondary containment, spill response equipment, fire extinguishers, personal protective equipment, to securely manage HM at the IP.

D. An MSDS for each HM brought onto WPAFB by the contractor must be readily available at the project site or in the possession of the user prior to the HM being issued.

3.10 HAZARDOUS WASTE MANAGEMENT

A. Hazardous, Toxic, or Special Waste Disposal. The contractor shall manage all hazardous, toxic or special wastes which cannot be disposed of as solid waste in a "Subtitle D" landfill in accordance with all Federal, State, local and Air Force environmental laws, policies, regulations and procedures, including the Wright-Patterson Air Force Base Hazardous Waste Management Plan.

B. Satellite Accumulation Point (SAP): The contractor shall establish an SAP if any hazardous or other regulated wastes are to be stored on Wright-Patterson AFB for greater than 24 hours. For each SAP the contractor must apply in writing through the contract administrator to 88 ABW/EMC for a WPAFB "Hazardous Waste Storage Permit." The application must include the proposed SAP location, description of the regulated waste, estimated quantity of waste to be generated, and the type(s) of waste containers to be stored. The contractor shall manage the SAP in accordance with the WPAFB Hazardous Waste Management Plan and shall furnish all containers, labels, locks, security, chemical storage cabinets, secondary containment, spill response equipment, fire extinguishers, personnel protective equipment, and other materials as may be necessary. A maximum of 55 gallons of hazardous waste and/or one quart of acutely hazardous waste may be stored in an SAP at any one time. The contractor's environmental coordinator and alternate shall serve as the primary and alternate managers for each SAP. The SAP manager shall properly complete and maintain all required documentation associated with the SAP including, but not limited to, container labeling, material safety data sheets (MSDS), waste profile sheets, container tracking logs, weekly inspection logs, site-specific spill plans, and training certificates.

C. HW Disposal: The contractor shall be responsible for collection of all hazardous waste, proper containerization, labeling and secure storage of that waste on site. The contractor shall be responsible for repackaging any containers that are considered by Environmental Management to be unsuitable for shipment. The contractor will turn collected hazardous wastes over to the 88 ABW/EM representative by filling out a WPAFB Form 1438 Hazardous Waste Pick-up Form within twenty-four hours after the contractor has completed the project, exceeded 55 gallons HW or 1 quart acutely HW. (Note: Waste will be picked up at contractors HW storage site)

D. HW Turn-In: The contractor shall turn-in all HW generated on WPAFB to the 88 ABW/EM representative by filling out the following blocks of the WPAFB form 1438:

1. Name – Contractor Name
2. Building Number – Facility number where waste was generated
3. Extension Number – Phone number where hazardous waste site manager can be reached to schedule pick-up
4. UEC Coordination – Quality Assurance Evaluator / Job Inspectors signature
5. Waste Container Information – DOT Shipping name
6. Constituents – Constituents and associated percentages
7. EPA Waste Codes – self-explanatory
8. Check One – Check appropriate box
9. Process Generating Waste – How is the waste generated?
10. Container Type – Type of DOT shipping container
11. Container size – Volume of container
12. Number of containers – The number of hazardous waste containers requiring pick-up
13. Physical State – Solid / Liquid / Gas Sludge
14. pH – Self-explanatory
15. Flashpoint – Self-explanatory
16. Site Manager Signature – Contractors hazardous waste site manager signature

E. HW Recycling: Any hazardous waste that is being offered for recycling (e.g., batteries, solvent waste being sent for recycling, wipes being sent for laundering) may be handled outside of the normal HW disposal channels. The contractor shall obtain approval in writing through the contract administrator from 88 ABW/EMY prior to commencing any such operations. All recycled HW must be accompanied with a manifest signed by the 88 ABW/EMY prior to removal from WPAFB.

F. Used Oil and Waste Liquid Petroleum Products (WLPP): The contractor shall manage all Used Oil and WLPP in accordance with the 88 ABW/EM Used Oil and Waste Liquid Petroleum Management Policy #1-EM-94335.

G. The contractor shall be liable for all claims, costs, losses, damages and other expenses the government may incur as a result of the contractor's negligence or willful misconduct during the performance of this contract.

3.11 HM/HW CONTAINER STORAGE AND LABELING

A. The following container storage and labeling requirements shall be considered supplementary to all applicable Federal, State, and Air Force laws, regulations and policies governing the management of containers containing HW and/or HM. These requirements address the labeling and security of all items containing HW/HM including drums, bottles, boxes, cans, barrels, bags and miscellaneous containers. The contractor shall maintain a running inventory of material, waste and empty containers.

B. Labels

1. Each container shall be individually labeled with an adhesive label or tag with the following information:
   a. Contractors name
   b. Contractors address
   c. Contractors phone number
   d. Contract number
2. Each container shall be individually labeled. Labels shall be filled out legibly with a waxed based pencil (note: grease pencil) or other marking pen capable of withstanding diverse climate/weather conditions. Marking pen shall resist fading and streaking. Ballpoint pens, pencils, and magic markers are not acceptable.
3. All containers shall have one of the following acceptable labels properly filled out and in good condition:
   a. NON-REGULATED WASTE (Blue Label - NON-RCRA but DOT regulated, i.e.; sodium hydroxide solid)
   b. NON HAZARDOUS WASTE (Green Label - NON-RCRA / NON-DOT)
   c. HAZARDOUS WASTE
   d. EMPTY
   e. HAZARDOUS MATERIAL RAINBOW LABEL (Note: ID of chemical, hazard warnings, name and address of manufacture or other responsible party; note: not acceptable for waste materials)

f. MANUFACTURES LABEL (must have same information as required by RAINBOW label for HM)

g. LOCALLY DEVELOPED LABEL (consistent with section four listed below)

4. If a label becomes lost, worn, faded, or defaced in any manner, label shall be immediately replaced. Paper labels exposed to adverse weather conditions should be protected with a plastic overlaying to prevent deterioration.

5. Labels shall be properly filled out consistent with 29 CFR 1910.1200 (h), AFOSH Standard 161-21 and 40 CFR 262.32.

6. All containers that contain HW/HM shall have the operating organization and responsible parties name stenciled on the container/label. For bottles and vials too small to stencil, a self adhering label or tag containing the above mentioned information my be substituted. Bar coding systems that currently contain this information will meet this requirement (Note: All containers less than 1 gallon must have the specified information stenciled on it).

7. If containers of unknown constituents are found, 88 ABW/EMY shall be notified immediately and the unknown container(s) shall be marked with the following information:

a. Date when EM was notified.

b. Name and phone number of container owner.

c. Date, company name or organization symbol, phone #, and initials of the individual collecting a sample for laboratory analysis of the unknown contents.

8. Areas where more than 12 containers are stored homogeneously must be clearly sectioned off and identified that containers are empty. These shall have a sign affixed adjacent to the storage area to clearly identify BULK EMPTY CONTAINER STORAGE.

C. Security/Management: All containers must be secured so that they are under control of the contractor and to prevent access to unauthorized personnel (Note: Containers must be stored indoors or an area not accessible by general base population).

3.12 Affirmative Procurement

A. WPAFB has a requirement for the cost effective affirmative procurement of environmentally preferable products and services. Affirmative Procurement is defined as the process of purchasing environmentally preferable products, especially products manufactured from recycled and reclaimed materials. The purpose of WPAFB's Affirmative Procurement Program is to increase the purchase and use of products with the highest percentage of recovered materials practicable. The United States Environmental Protection Agency (USEPA) has designated 54 guideline items in the Comprehensive Procurement Guideline (CPG) III for mandatory procurement. These CPG products are products that are or can be made containing recycled materials. In the CPG, the USEPA organizes these items into 8 product categories as follows:

1. Construction Products
2. Landscaping Products
3. Non-paper Office Products
4. Paper and Paper Products
5. Park and Recreation Products

6. Transportation Products
7. Vehicular Products
8. Miscellaneous Products

Note: A current detailed listing of these products and recycled content requirements can be found on USEPA's web site at http://www.epa.gov/cpg/products.htm. Once in the web site, to view the products, click on one of the 8 categories. Within a category, click on a specific product. The following information will be provided: Recommended Recovered Materials Content levels, Product Specifications, and Product Information, which includes the list of manufacturers and suppliers. Click on the file to open and a list of suppliers will be provided.

B. In accordance with 40 CFR 247.2, the contractor is required to research, propose, and utilize these designated products, and any other recycled-content products available in the market place. CPG products with the highest percentage of recovered materials practicable shall be utilized, unless otherwise specified, or if one or more of the following exemptions apply:

1. Does not meet appropriate performance specifications.
2. Is not available competitively (from two or more sources).
3. Is not available within a reasonable time frame.
4. Is only available at an unreasonable price.

C. The contractor shall certify that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by applicable specifications or other contractual requirements, and shall also estimate the percentage of total material utilized for the performance of the contract which is recovered material. If CPG products are not utilized, the contractor shall provide written explanation and documentation as to why the products were not used.

D. Additional information concerning Affirmative Procurement can be obtained from the Office of Environmental Management, Quality Branch (88ABW/EMY) at (937) 257-2184 or by visiting the following 88ABW/EM website: http://www.abwem.wpafb.af.mil/em/

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - PROCEDURES

1.01 GENERAL SUBMITTAL PROCEDURES

A. Submit for approval all items and related information shown on the list of submittals at the end of this section.

B. All submittals shall be accompanied by a thoroughly completed AF Form 3000.

C. All separate items forming parts of any submittal shall be clearly marked to indicate the specific submittal requirement to which they apply. Unmarked catalog cuts, samples, technical data, etc. will be returned disapproved.

D. For all submittals, including operation and maintenance manuals, submit a minimum of five copies of the submittal item.

E. All required product data, performance data, device schedules, installation instructions and qualifications statements shall be submitted within 10 calendar days after receipt of notice to proceed. All required performance procedures, and schematic diagrams, and shop drawings shall be submitted within 30 calendar days after receipt of notice to proceed. Test reports shall be submitted within 10 calendar days after test completion. Record documents and operation and maintenance manuals shall be submitted and approved prior to application for payment in excess of 90 percent of the contract amount.

1.02 SUBSTITUTE PRODUCTS

A. The contractor is required to use all items as herein specified, unless an "equal or better" item is approved. In order to use an "equal or better" item the contractor shall submit all technical data, including any aesthetic information as requested, to show that the product is "equal or better". A list of deviations from the specified item may be requested by the Government.

B. If a specified item is obsolete, no longer manufactured or otherwise impossible to obtain, the contractor must inform the contracting officer in writing by the submittal due date for that item. The contractor will then be given a reasonable amount of time to submit technical data and information on an "equal or better" item to be substituted for the unavailable item.

1.03 MATERIAL AND PRODUCT STANDARDS

A. Where materials or equipment are specified to conform to various standards the contractor shall submit proof that the items furnished conform to such requirements. A certification or published catalog specification data statements to the effect that the item is in accordance with the referenced standard will be acceptable as sufficient evidence that the item conforms to the requirements.

B. In lieu of such certification, or data statement the contractor may submit a written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested in accordance with listed procedures where applicable, and that the units conform to the listed requirements. Conformance with such test requirements shall not be interpreted as complete acceptance; the tested item must still comply with all other requirements of the specifications.

1.04 RETURN OF SUBMITTALS

A. One copy of the submittal documents will be returned (except record documents and operation and maintenance manuals) with the Government action noted within 30 calendar days after Government receipt of the complete submittal package.

1.05 RESUBMITTALS

A. If a submittal item is not approved by the government revise the submittal as required to meet all specified requirements and resubmit. Mark all changes made since the previous submittal. Resubmittals shall be numbered to match original submittals but letter suffixes shall be added. For example, the first resubmission of submittal number 12 would be numbered 12A. The second resubmission would be number 12B.

1.06 CONTROL OF WORK GOVERNED BY SUBMITTALS

A. No products or materials covered by a submittal item shall be delivered to the site before the corresponding submittal has been approved by the government.

B. No on-site work covered by a submittal item shall begin before the corresponding submittal has been approved by the government.

C. Payment will be withheld for all products, materials and contract work covered by submittal items until the corresponding submittals have been approved by the government.

D. Time extensions will not be granted for any delay due to late or incomplete submittals or due to disapproval of submittals which are not in full compliance with contract requirements.

1.07 TYPES OF SUBMITTALS

A. The following paragraphs describe general requirements for some common types of submittals.

1. Product Data shall be in the form of manufacturers standard preprinted literature or a notarized statement signed by an individual legally authorized to obligate the manufacturing firm. If requested by the owner, the notarized statement shall be accompanied by legal documents providing authorization. Product data shall clearly show full compliance with each and every contract requirement for the particular product. Product data submittals shall also include wiring diagrams.

2. Performance Data shall be in the form of manufacturers preprinted charts, curves, graphs or certified test reports by an independent professional testing agency. Performance data shall include all input and output data over the entire range of operation of the particular item. Performance data shall clearly show the limits of the manufacturer's recommended operating range.

3. Schematic diagrams shall be in the form of accurate non-scale drawings prepared specifically for this project showing all components of a system and showing how all components are interconnected. Schematic diagrams shall include product data for each component and shall include a written sequence of operation explaining step by step operation of the system in detail.

4. Shop Drawings shall be in the form of drawings to scale. Shop drawings shall show the size, type and arrangement of the particular equipment or system and of all components, connections and mountings. Shop drawings shall clearly show the relationship of the new work to the existing construction. Shop drawings shall clearly show how the particular system will operate and that operation will be as specified.

5. Device schedules shall be in the form of a complete material list with all devices listed by manufacturer's model number, location, size and color. Each device listing shall include a description of options to be furnished.

6. Qualifications Statements shall be in the form of letters, licenses or certificates. Letters shall be signed by a major principal of the firm being submitted. Licenses or certificates must be issued by public authorities or nationally recognized agencies representing the appropriate industry. Qualifications statements shall clearly show full compliance with all contract qualifications requirements.

7. Installation instructions shall be in the form of manufacturer's standard literature. Instructions shall clearly specify all procedures which must be followed to assure that no conditions of either the manufacturer's warranty or any required agency listing, labeling or approval are violated. Instructions shall show all wiring and connection diagrams.

8. Performance Procedures shall be in the form of typewritten reports prepared specifically for this contract. The report shall describe in full detail all procedures which will be utilized in performing the particular task. All contractor owned instruments to be utilized shall be noted. The report shall include calibration histories for all instruments subject to calibration. The report shall fully describe any and all contract requirements which appear difficult to comply with if any such situations exist. The report shall contain a statement that full contract compliance will be achieved or shall request specific exceptions.

9. Test Reports shall be in the form of typed data sheets accompanied by copies of the handwritten field test data sheets. Handwritten sheets shall bear the signature of the Contracting Officer's Representative obtained at the time of the testing. Test data shall include all information required to be shown. Testing shall be considered incomplete until all test quantities are within specified tolerance.

10. Record documents shall be in the form of a set of neatly redlined blueprints of the original contract drawings revised to reflect any changes or variations in actual final conditions from what was shown on the original contract plans. Record documents shall include a clean set of specifications with an appendix containing all addenda and change orders. Each specification section shall be annotated to show the manufacturer, trade name, catalog and supplier of each product and item of equipment installed. Redlined blueprint record documents shall be updated daily during construction. Store record documents in contractors field office apart from documents used for construction. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes. Provide red marking pencils for marking information. Label each document "PROJECT RECORD DOCUMENT" in neat ½ inch red letters adjacent to the title block.

    Accompany submittal with transmittal letter containing:

    Date
    Project title, contract number and project number
    Contractor's name and address
    Title and number of each record document

Signature of contractor or authorized representative

11. Operation and Maintenance Manuals shall be in the form of 3-ring loose leaf binders containing all specified submittal data and the manufacturer's recommended operating and maintenance procedures. Each set shall include as many binders as needed to contain all of the required information. The information shall be organized to follow the same order as the specifications.
12. Asbestos Containing Materials (ACM): Submittals for ACM removal shall be as listed in Articles 1.05 of Section 02081: Removal and Disposal of Asbestos Containing Materials.
13. Paint Containing Lead: Submittals for removal and management of paint containing lead shall be as listed in Articles 1.09 and 1.10 of Section 02090: Removal and Disposal of Paint Containing Lead materials (OSHA Compliance).

INSULATION: SUBMITTALS OF INSULATION SHALL BE AS LISTED IN ARTICLE 1.05 OF SECTION 12250: PIPING INSULATION.

END OF SECTION

SUBMITTAL LIST

Section	Item or Material	Product Data	Performance Data	Letter of Certification	Shop Drawings	Test Reports	Schematic Diagrams	Device Schedule	Qualification Statement	Installation Instructions	Performance Procedure	Operation & Maint. Manuals	Other
01015	Project												Work schedule
01015	Project										X		Record Documents
01015	Project												Site Layout plan
01015	Project												Close-out certification
01020	General Environmental												See Specification
02081	Asbestos Removal												See Specification
02090	Lead Paint			X		X			X		X		See Specification
15020	Welding Qualifications												See Specification
15250	Piping Insulation	X			X								Records
15400	Plumbing Systems	X		X	X								Disinfection Certificate

SECTION 02081

REMOVAL AND DISPOSAL OF
ASBESTOS CONTAINING MATERIALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This specification pertains to the removal, handling and disposal of Asbestos Containing Materials (ACM) including all labor, materials and equipment required to protect all personnel from exposure to airborne asbestos fibers.

B. The work includes removal of ACM in accordance with the report "Asbestos Renovation Survey – Main Water Distribution Line, WPAFB Facility 21601 (18C) and facility 21603 (18E), Fairborn, Ohio" prepared by Buckeye Asbestos Removal, Inc. which is included in Appendix A of these specifications.

1.02 APPLICABLE PUBLICATIONS: THE CONTRACTOR SHALL HAVE ONE COPY OF ALL APPLICABLE PUBLICATIONS LISTED in paragraph 1.02 available at the job site at all times.

A. Environmental Protection Agency (EPA)

1. Title 40 Code of Federal Regulations (CFR), Part 61, Subpart M. National Emission Standard for Asbestos (40 CFR 61M).

2. Title 40 Code of Federal Regulation, Part 763. Subpart 5, Appendix C, Accreditation Requirements.

3. EPA 560/5-85-024, Guidance for Controlling Asbestos Containing Materials in Buildings.

B. Occupational Safety and Health Administration (OSHA)

1. Title 29, Code of Federal Regulations, Part 1926.1101, (29 CFR 1926.1101).

2. Title 29 Code of Federal Regulations, Part 1910 (ALL)

3. Title 29 Code of Federal Regulations, Part 1926 (ALL)

C. Department of Transportation (DOT)

1. Title 49, Code of Federal Regulations, Sections 171 and 172, Hazardous Substances Final Rule.

D. Ohio Revised Code (ORC), Sections 3710.01 through 3710.99

E. Ohio Administrative Code (OAC), Chapter 3745-20 and 3701-34

F. Underwriters Laboratories, Inc., (U.L.)

1. U.L. 586, High Efficiency, Particulate, Air Filters Units.

1.03 QUALIFICATIONS

A. The contractor shall have a current license as an Asbestos Hazard Abatement Contractor issued by the Ohio Department of Health (ODH).

B. The designated competent person shall be employed directly by the Abatement Contractor and certified as an Asbestos Hazard Abatement Specialist by the Ohio Department of Health. The competent person shall be listed on the ODH notification and on site during all abatement activities.

C. The Certified Industrial Hygienist (CIH) shall be currently certified by the American Board of Industrial Hygiene in comprehensive practice.

D. The Industrial Hygiene (IH) Technician or Air Monitoring Technician (AMT) shall be certified as an Asbestos Hazard Evaluation Specialist by the Ohio Department of Health.

E. The testing laboratory shall be a current participant in the National Institute of Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program for Asbestos Analysis. The testing laboratory shall also be accredited by the American Industrial Hygiene Association (AIHA) Program for Phase-Contrast Microscopy (PCM) analysis and the National Voluntary Laboratory Association Program (NVLAP) for Transmission Electron Microscopy (TEM) analysis.

F. The landfill used for disposal shall be EPA approved for all friable and category II non-friable ACM. Category I non-friable ACM shall be disposed of in a sanitary landfill.

1.04 DEFINITIONS

A. Terms used in the specification section applicable to asbestos abatement work shall be as defined in 29 CFR 1926.1101.b and 40 CFR 61.141.

B. Certified Industrial Hygienist is defined as an individual certified in comprehensive practice by the American Board of Industrial Hygiene, 4600 W. Saginaw, Ste 101, Lansing, MI 48917.

C. The following terms are defined in the Ohio Revised Code, Section 3710.01 through 3710.99:

1. Asbestos Hazard Abatement Contractor

2. Asbestos Hazard Abatement Specialist

3. Asbestos Hazard Evaluation Specialist

4. License

5. Certificate

D. Critical Barrier is defined as an air tight seal over an opening in a floor, wall or ceiling including but not limited to pipe or duct penetrations, doors, windows, air diffusers, immovable objects and carpeting. Critical barriers are separate from the negative pressure enclosure and shall be sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area. All critical barriers shall be constructed of six mil (minimum) poly and duct tape.

E. On-site: Within the immediate working area.

1.05 REQUIREMENTS

A. The contractor shall be responsible for designing the systems listed below in complete conformance to the requirements of 29 CFR 1926.1101 and 40 CFR 61, Subpart M, and their non-mandatory appendices. The contractor shall comply with additional requirements for performance of the work as noted in the specifications and project drawings.

1. Exposure monitoring system approved by the Certified Industrial Hygienist. On-site analysis is prohibited for all air sampling except personal samples. The Industrial Hygiene Technician shall be on-site during Class I and Negative Pressure Enclosure (NPE) removal operations and during background and final air sampling.

2. Engineering Control

   a. Engineering controls and work practices shall conform totally to the recommended procedures in Appendix F of 29 CFR 1926.1101 as though Appendix F was listed as a mandatory requirement. A NPE as described in 29 CFR 1926.1101 (g)(5)(i) and Appendix F of 29 CFR 1926.1101 is required unless otherwise indicated on drawings or approved by 88 ABW/EM.

   b. Prohibit the use of glove-bags outside of a NPE (as described in 29 CFR 1926.1101 (g)(5)(i) and Appendix F of 29 CFR 1926.1101) unless otherwise indicated on drawings or approved by 88 ABW/EM.

3. Hygiene Facilities

   a. Showers shall be portable type, shall comply with OSHA 29 CFR 1910.141.D3 and shall be contiguous both to the equipment room and the clean change room. The decontamination unit shall be contiguous to the containment unless otherwise approved by a representative of 88 ABW/EM.

   b. The clean/change room shall be constructed of six-mil poly, be at least 24 square feet in size with no dimension less than four feet and be equipped with appropriate means for storing street clothes (up off the floor).

   c. Contractor shall supply soap, towels, and a warm water supply for decontamination procedures for abatement workers, IH technicians and contract inspectors. An on-site warm water supply may not be available.

   d. Provide a positive back flow prevention control device at each hose connection to the facility water supply system.

   e. Waste water shall pass through a five micron filter before being discharged into the facility sanitary system.

4. Personal Protective Equipment

   a. Disposable coveralls, gloves, boots and head covering shall be supplied for abatement workers, Industrial Hygiene technicians and contract inspectors.

   b. Respirators shall be approved and selected per OSHA 29 CFR 1926.1101 (h) (2)(ii).

B. All visual inspections and clearance requirements performed by 88 ABW/EM shall require a minimum of 24 hours prior notice. Contractor shall be responsible for setting up an appointment

with 88 ABW/EM for inspections and air sample clearances through the Civil Engineering Contract Inspector.

1.06 PERFORMANCE REQUIREMENTS

A. The contractor shall be responsible for complete compliance with all mandatory requirements of EPA 40 CFR Section 61, Subpart M and 29 CFR 1926.1101 along with the recommendations of all of the non-mandatory appendices.

B. The contractor shall have one copy of all applicable publications listed in paragraph 1.02, copies of the approved Pre-abatement submittal, RAPCA and ODH notifications, WPAFB specification section 02081, current Ohio certifications, medical examinations and respirator fit tests for all personnel available at the job site at all times and Task Statement of Work.

C. If suspected or presumed asbestos containing materials not covered by the drawings or specifications are encountered, the Contractor shall immediately stop work in the area of the suspect material and notify the Contracting Officer, a representative of 88 ABW/EM, and the technical representative of 88 CEG/CEC.

D. The Contractor shall perform demolition/renovation work without damage or contamination of adjacent work areas. Where such areas are damaged or contaminated, the work areas shall be restored to their original condition at the Contractor's expense.

E. Non-abatement work shall not be performed in an asbestos regulated area unless otherwise approved by a technical representative of 88 CEG/CEC or a representative of 88 ABW/EM.

F. Daily inspection checklists (provided by the Government) shall be completed and signed and dated for each work shift by the Industrial Hygiene Technician and competent person when an IH is required to be on site. When there is no IH required to be on site, the daily inspection checklist shall be completed and signed and dated by the competent person daily.

G. No site work, set-up or removal, shall begin prior to approval of the pre-abatement submittal requirements, listed in see section 1.08.A of this specification.

1.07 PERMITS AND NOTIFICATIONS

A. The Contractor shall be responsible for obtaining all required permits for removal, transport and disposal of asbestos-containing materials. The Contractor shall also be responsible for complying with the notification requirements of the Ohio Environmental Protection Agency (OEPA) and the Ohio Department of Health as the law requires. The OEPA notification shall be sent to the local EPA office (Regional Air Pollution Control Agency (RAPCA)). Send notifications to the following addresses:

1. RAPCA, 451 West Third Street, P.O. Box 972, Dayton, Ohio 45422.

2. Ohio Department of Health, Division of State Environmental Services, P.O. Box 118, Columbus, Ohio 43244-0118.

1.08 SUBMITTALS (FORM 3000 TO CONTRACTING)

A. Pre-Removal (items submitted with each task)

1. Precise Site Drawings

a. Scaled site drawing

b. Regulated area and/or demarcation of the enclosure

c. Hygiene facilities

d. Negative pressure system and air flow patterns

e. Location, size and construction of all critical barriers

f. All ACM locations identified as "to remain" or "to be removed". Identify the material i.e., 6-inch diameter pipe insulation, 1-inch thick ceiling tile, etc.

g. Location (Bldg. and room number) and size (sq. ft.) of regulated area.

h. Copy of all asbestos related blueprints (if applicable)

2. Qualifications Statements/Licenses (items submitted with each task)

a. Asbestos Hazard Abatement Ohio Contractor License

b. Asbestos Hazard Abatement Specialist Ohio Certification

c. Asbestos Abatement Worker Ohio Certifications

d. Asbestos Hazard Evaluation Specialist Ohio Certification

e. Certified Industrial Hygienist Ohio Certification

f. Testing Laboratory Certifications (AIHA and NVLAP)

g. EPA approved landfill qualifications

h. All MSDS documents for all chemicals being used on WPAFB

3. Performance Procedures (items submitted with each task)

a. Strategy and frequency of exposure monitoring

b. Air sampling and analytical procedure

c. Project Asbestos Abatement Plan including the information listed in OSHA 1926.1101, Appendix F, Paragraph "Planning the Removal Project."

d. Proposed method to ensure temperatures do not fall below 45°F, when applicable.

e. Copies of OEPA (RAPCA) and ODH notifications

4. Other Submittals (these items are one time with original submittal only)

a. Employee training program (safety, confined spaces, Haz Com, etc.,)

b. Respirator training program

c. Medical surveillance program

d. Emergency procedures (breech in enclosure, fire, personal injury, etc.,)

e. Insurance Certificates (Asbestos Liability and Workers' Compensation)

f. Laboratory quality control program (PAT program)

g. Complete list of employees in the medical surveillance program

B. Post-Removal

1. Background, personal, area and final air sampling reports prepared by the I.H. Technician and certified by the Laboratory Analyst and CIH. All reports shall include name of abatement contractor, building number, room/containment number, sampling date, date of analysis and chain of custody for each sample.

2. Daily inspection checklists (provided by the Government) shall be completed and signed and dated for each work shift by the Industrial Hygiene Technician and competent person for class I work and NPE. For all other class work the daily inspection checklist shall be completed and signed and dated by the competent person.

3. Air pressure differential strip chart recordings (see section 3.01.0A.5 of this specification).

4. WPAFB Asbestos Containing Waste Manifest signed by a representative of 88 ABW/EM, the transporter(s) and the disposal site certifying the amount of ACM waste. NOTE: If the manifest(s) has already been submitted, provide the WPAFB manifest number(s) for each shipment.

5. Post-abatement submittal requirements listed above, except number 4, shall be submitted within 10 working days from the completion of the asbestos removal portion of the project.

1.09 DISPOSAL OF MATERIAL

A. Materials resulting from abatement work shall be considered ACM and be handled as such during the removal and transportation process and shall be disposed of as ACM in an EPA approved landfill unless otherwise stated.

B. All ACM shall be sealed in durable leak-tight disposal containers or an approved alternative disposal system in accordance with paragraph (C) of OAC 3745-20-05. The transport vehicle shall be poly-lined equal to the total height of the ACM containers.

C. All asbestos waste containers shall be properly labeled with the required OSHA, EPA and DOT information before being transported from the work site. The secured (locked) transport vehicle shall be properly marked with class nine placards for transport purposes.

D. When the Contractor is prepared to transport any ACM from the boundaries of Wright-Patterson Air Force Base (WPAFB), the Contractor shall first contact 88 ABW/EM for an inspection of the

transport vehicle and materials to be transported. Provide a minimum of 24-hour advanced notice with a description of the material, number and type of containers (bags, drums, pipes etc.,) and the quantity of each in cubic yards. The asbestos waste shipment record(s) (manifest(s)), provided by a representative of 88 ABW/EM, shall accompany the waste to the disposal site. Upon initial transportation from the boundaries of WPAFB, the Contractor shall be responsible for having the waste delivered to the approved disposal site identified on the Ohio EPA (RAPCA) notification within 35 days. The contractor shall ensure that the original copy of the manifest, signed and dated by all parties (88 ABW/EMC, waste transporter, and landfill agent) is returned to 88 ABW/EM within 45 days of the date initially transported from WPAFB or 10 days after the waste is received by the approved disposal site, whichever is more stringent.

E. Water used during any part of the abatement project including decontamination procedures, shall enter the facility sanitary system only after it has first passed through a five micron filter.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All materials and manufactured units utilized in the asbestos removal process shall meet the requirements of 29 CFR 1926.1101 and its mandatory appendices. Materials shall also meet the recommendation of the non mandatory appendices as though the recommendations were mandatory.

B. HEPA filters shall conform to U.L. 586.

C. All poly barriers shall be constructed of 6 mil poly to provide a positive airtight seal for the duration of the asbestos removal procedures.

PART 3 - EXECUTION

3.01 REMOVAL PROCEDURES

A. All Negative Pressure Enclosure procedures shall conform to the requirements of 40 CFR 61.M and 29 CFR 1926.1101, its mandatory appendices and the recommendations of its non-mandatory appendices. The Asbestos Hazard Abatement Specialist shall perform an Initial Exposure Assessment (IEA). The IEA shall be approved by 88 ABW/ EM for all removal procedures listed in section 3.01.0A. The following requirements for Negative Pressure Enclosures are in addition to and more stringent than the requirements referenced above:

1. Shut down all HVAC and electrical systems in the work area if possible. HVAC systems shall be sealed with two layers of 6 mil plastic (poly). All electrical sources shall be supplied from outside the containment area and have a Ground-Fault-Interrupt (GFI) system installed. Contractor must contact the Contract Inspector to coordinate any HVAC or electrical outages.

2. Prior to constructing the negative pressure enclosure, clean and wet-wipe all surfaces and then install the critical barriers using a minimum of six mil plastic sheeting.

3. Any wall constructed as part of the containment area shall be self-standing and of two by four construction. Other construction methods shall be approved by the on-site inspector prior to set-up. If torching inside the negative pressure enclosure is necessary, materials used shall be flame resistant.

4. Prior to the removal of any asbestos containing material, two layers of six mil poly shall be used to cover the floor. The poly shall be flush with the walls at each corner, extend 24 inches up the wall, and sealed with duct tape. Seams of the first and second layer shall offset. All seams shall be sealed with spray glue and duct tape. Two layers of six mil poly shall be hung on walls using nails and furring strips or adhesive and duct tape. The layers shall be hung as to overlap the floor sheets by 24 inches, sealed utilizing spray glue and/or duct tape, and the bottom seams shall offset by at least 12 inches. A viewing window shall be installed in each containment, the location of which shall be approved by the on-site inspector.

5. Provide an air pressure differential strip chart recorder to demonstrate that negative pressure (-.02 inches of water) is maintained at all times. Recording device shall have a scale of 0 to -0.25 or -0.50 inch of water and 0.005 or 0.01 inch graduation. Calibrate recording device daily. Additionally, maintain a minimum of four air exchanges per hour in the Negative Pressure Enclosure. The strip chart recordings shall be taken for the duration of the containment (pre-removal inspection until approval for tear down) and signed daily by the IH Technician. The IH Technician shall record the name of the abatement contractor, building number, containment number (as shown on the pre-inspection checklist), date, and time signed on each strip chart at the end of each work shift.

6. If barriers cannot be completed because of the removal of ceiling materials or asbestos contaminated debris, a preliminary pre-inspection shall be performed by a representative of 88 ABW/EM. After the preliminary pre-inspection has been approved, the critical barriers shall be completed and a final pre-inspection is required before gross removal begins.

7. Prior to the removal of any asbestos containing material, the set-up shall be approved by a designated representative of 88 ABW/EM. All inspections require a minimum of 24-hour notice.

8. Respirator protection shall be selected in accordance with 29 CFR 1926.1101 (h)(2). During gross removal all contract personnel entering the work area shall wear, at a minimum, a full-face Powered Air Purifying Respirator (PAPR) or a respirator with an equivalent protection factor unless 29 CFR 1926.1101 (h)(2) is more stringent.

9. Amended water shall be applied to all ACM before and during removal. The ACM shall remain adequately wet until disposition in the approved landfill.

10. All ACM waste shall be promptly placed in leak tight containers and the work area cleaned at the end of each work shift. Material shall not be left on the floor during non-work periods. All containerized ACM waste shall be stored in an enclosed, locked vehicle (truck, dumpster, etc.,) at the end of each work shift.

11. After the gross removal and cleanup of all suspect materials, a final visual inspection shall be conducted by a representative of 88 ABW/EM. Any debris found during the inspection shall be cleaned by the Contractor. Once the final visual inspection passes, all substrate surfaces from which ACM has been removed shall be coated with an approved encapsulant. The area shall be fogged with the encapsulant to lock down any suspended fibers left in the area and allowed to dry. The encapsulant used shall have an adequate tint to easily distinguish between sections encapsulated and not encapsulated. After encapsulation, any person entering the work area shall wear at minimum a negative pressure half-face respirator or a respirator with an equivalent protection factor.

12. Negative pressure glove bag techniques shall only be used inside of a negative pressure enclosure as described in 29 CFR 1926.1101 (g) (5) (i) and Appendix F of 29 CFR 1926.1101 unless otherwise indicated on drawings or approved by 88 ABW/EM.

B. The following are removal procedures for Asbestos-Containing Pipe Insulation by the Wrap and Cut Method. All applicable Federal, State and Local regulations as well as applicable sections of specification 02081 shall be followed when performing the procedures listed in section 3.01.0C. The Asbestos Hazard Abatement Specialist shall conduct an IEA. The IEA shall be approved by a representative of 88 ABW/ EM for all removal procedures listed in section 3.01.0C.

1. Background samples shall be taken in the work area(s) and in adjacent areas of the building before any set-up or disturbance to access the area of work.

2. Set-up a remote three stage decontamination unit. Location of decontamination unit shall be approved by the on-site inspector representing 88 ABW/EM. All remote decontamination units shall be under negative pressure by use of an air filtration device at the dirty room. After final use, a PCM final air clearance sample shall be taken in the dirty room of the remote decontamination unit.

3. Contractor shall demarcate removal area and lay 6 mil poly below all piping that is to be removed.

4. Contractor shall pre-clean any visible or suspected ACM around removal area prior to wrapping the pipe. The contractor shall repair all damaged areas with re-wetable cloth prior to wrapping the pipe.

5. Wet all pipe insulation with amended water before wrapping.

6. Wrap pipe with 2 layers of 6 mil poly and seal with duct tape.

7. If pipe insulation and piping is to be cut into sections, hang negative air glove bags, in accordance with section 3.01.0D, to perform removal of the asbestos pipe insulation before cutting piping. After removal of insulation, seal exposed ends of asbestos and/or fiber glass insulation with wettable cloth before removing the glove bag.

8. Pipe shall be cut into sections as necessary, properly labeled and placed into locked containers.

9. All wrap and cut removal procedures shall be performed after duty hours or on weekends unless otherwise approved by 88 ABW/EM.

10. Suits and respirators shall be worn during all abatement operations.

11. Workers shall use double suit procedures from all work areas to remote decontamination unit.

12. Personal air samples shall be taken during all work procedures by a qualified Asbestos Hazard Abatement Specialist.

13. A pre-removal inspection shall be performed after glove bags have been installed or before wrapped piping is removed. A final visual inspection shall be performed after all removal is completed in each area. All pre-removal and final visual inspections shall be conducted by a representative of 88 ABW/EM and require a minimum of 24 hours notice.

14. If any personal air samples exceed the PEL or if any uncontained asbestos is damaged or made friable by the contractor, the contractor shall stop work immediately and contact the Contracting Officer and a representative of 88 ABW/EM. The contractor may be required by regulation or by the Contracting Officer to perform full containment procedures as listed in specification 02081 section 3.01.0A.

C. The following are removal procedures for the use of Negative Air Glove Bags. All applicable Federal, State and Local regulations as well as applicable sections of specification 02081 shall be followed when performing the procedures listed in this section 3.01.0D. The Asbestos Hazard Abatement Specialist shall perform an IEA. The IEA shall be approved by a representative of 88 ABW/ EM for all removal procedures listed in this section.

1. Background samples shall be taken in the work area(s) and in adjacent areas of the building before any set-up or disturbance to access the area of work.

2. Contractor shall demarcate and place 6 mil poly below the removal area.

3. Contractor shall repair any damaged Thermal System Insulation (TSI) prior to hanging the glove bag.

4. Suits and respirators shall be worn during all set up and removal procedures.

5. Hang glove bag on removal area.

6. The contractor may use continuos glove bags on straight pipe runs, but each glove bag shall have negative air pressure and a make-up air port. All hoses to negative air glove bags shall be at least ½ inch inside diameter. Glove bags must have the hose attached to the bag prior to the pre-inspection. No more than 6 continuos glove bags may be performed for one removal section at a time or continuos glove bags may only be performed between pipe hangers. After removal and encapsulation is complete in continuos glove bags, the ends of each bag shall be sealed to the bare pipe before the glove bag is removed. All fittings (may have several fittings in one bag) shall be performed as one singular negative air glove bag. The contractor's work plan submittal shall describe, in detail, all negative air glove bag removal procedure.

7. After removal of insulation in the glove bags, seal exposed ends of any asbestos and/or fiberglass insulation that is not to be removed within the bag with wetable cloth before removing the glove bag.

8. Contractor shall use a three stage remote decontamination unit and workers shall use double suit procedures when proceeding to the remote decontamination unit. The dirty room of the remote decontamination unit shall be under negative pressure. Contractor shall take one PCM final air sample in the dirty room of the decontamination unit after final use.

9. A pre-removal inspection shall be performed after glove bag is installed and sealed with duct tape. A final visual inspection shall be performed when the glove bag and clean-up is completed. All pre-removal and final visual inspections shall be conducted by a representative of 88 ABW/EM and require a minimum of 24 hours notice.

10. Seal exposed ends of asbestos and/or fiber glass insulation with wettable cloth before removing the glove bag. After removal is complete, the end of each glove bag shall be sealed to the bare pipe before the glove bag is removed.

11. Personal air samples shall be taken during all negative air glove bag procedures by a qualified Asbestos Hazard Abatement Specialist.

12. All glove bag removal shall be performed after duty hours or weekends, in occupied areas, unless otherwise indicated on drawings or approved by 88 ABW/EM.

D. The following are removal procedures for the use of Negative Pressure Mini Enclosures. All applicable Federal, State and Local regulations as well as applicable sections of specification 02081 shall be followed when performing the procedures listed in section 3.01.0E. The Asbestos Hazard Abatement Specialist shall perform an IEA. The IEA shall be approved by a representative of 88 ABW/ EM for all removal procedures listed in section 3.01.0E.

1. Background air samples shall be taken in the work area(s) and in adjacent areas of building before any set-up or disturbance to access the area of work.

2. Mini enclosures shall follow all set-up requirements of specification 02081 section 3.01.0A, with the exception that only a double air lock shall be attached to the containment.

3. Workers shall use double suit procedures to a remote three stage decontamination unit. Mini enclosures can only be used in conjunction with a remote three-stage decontamination unit.

4. Remote decontamination units shall be under negative pressure by use of an air filtration device on the dirty room.

5. After final use, a PCM final air clearance sample shall be taken in the dirty room of the remote decontamination unit.

6. An IH Technician or an AMT is required to take all area, personal and final air clearance samples for mini enclosure operations.

7. Personal air samples may be analyzed on-site by a certified IH Technician. Final air clearance samples shall be analyzed by a laboratory approved by 88 ABW/EM.

8. Final air clearance sampling for mini enclosures shall be accomplished in accordance with section 3.02.0C of specification 02081.

9. Mini enclosures require a pre-removal inspection and a final visual inspection by a representative of 88 ABW/EM. A minimum of 24 hours notice is required for all 88 ABW/EM inspections.

E. The following are removal procedures for Non-Friable Transite on Interior Building Surfaces. All applicable Federal, State and Local regulations as well as applicable sections of specification 02081 shall be followed when performing the procedures listed in section 3.01.0F. The Asbestos Hazard Abatement Specialist shall perform an IEA. The IEA shall be approved by a representative of 88 ABW/ EM for all removal procedures listed in section 3.01.0F.

1. Background samples shall be taken in the work area(s) and in adjacent areas of the building before any set-up or disturbance to access the area of work.

2. Set up a three stage decontamination unit in or adjacent to the removal area. All remote decontamination units shall be under negative pressure by use of an air filtration device at the dirty room.

3. After final use, a PCM final air clearance sample shall be taken in the dirty room of the remote decontamination unit.

4. Suits and respirators shall be worn during all procedures for transite removal.

5. Personal air samples shall be taken during all work procedures for transite removal by a qualified Asbestos Hazard Abatement Specialist.

6. Contractor shall demarcate the removal area, place critical barriers over all openings in the removal area and lay 6 mil poly on the floor of the removal area.

7. Wet all transite surfaces with amended water.

8. Remove transite in an intact state and wrap in 2 layers of 6 mil poly or place in a leak-tight container.

9. Properly label and store in locked transport vehicle. All transite material shall be disposed of in an EPA approved landfill.

10. If during removal, contractor causes transite to be rendered friable or personal air samples exceed the PEL, the contractor shall stop work immediately and notify the Contracting Officer and a representative 88 ABW/EM. The contractor may then be required by regulation or by the Contracting Officer to perform full containment procedures in accordance with section 3.01.0A of specification 02081.

11. A pre-removal inspection is required after set-up of the decontamination unit and removal area. A final visual inspection is required after transite removal and clean-up is complete for each area. All pre-removal and final visual inspections shall be conducted by a representative of 88 ABW/EM and require a minimum of 24 hours notice.

12. Removal of interior transite shall be performed after duty hours or weekends unless otherwise indicated on drawings or approved by 88 ABW/EM.

F. The following are removal procedures for any other Class II (as defined by 29 CFR 1926.1101(b)) ACM for which specific procedures have not already been listed in section 3.01 of this specification. All applicable Federal, State, and Local regulations as well as applicable sections of specification 02081 shall be followed when performing the procedures listed in section 3.01.0H. The Asbestos Hazard Abatement Specialist shall perform an IEA. The IEA shall be approved by a representative of 88 ABW/EM for all removal procedures listed in section 3.01.0H.

1. Suits and respirators shall be worn during all abatement operations.

2. Personal air samples shall be taken during all work procedures.

3. Contractor shall demarcate the regulated area and place critical barriers over all openings in the removal area.

4. Set-up a remote three stage decontamination unit unless otherwise indicated on drawings or approved by 88 ABW/EM. Location of decontamination unit shall be approved by the on-site inspector representing 88 ABW/EM. All remote decontamination units shall be under negative pressure by use of an air filtration device on the dirty room. After final use, a

PCM final air clearance sample shall be taken in the dirty room of the remote decontamination unit.

5. Workers shall use double suit procedures from all work areas to remote decontamination unit.

6. The material shall be thoroughly wetted with amended water prior to and during its removal.

7. The material shall be removed in an intact state and kept non-friable. Cutting, abrading or breaking the material is prohibited. If during removal the contractor renders the material friable or personal air samples exceed the PEL, the contractor shall stop all work and notify the Contracting Officer and a representative of 88 ABW/EM. The contractor may be required by regulation or by the Contracting Officer to perform full containment procedures as listed in specification 02081, section 3.01.0A.

8. All ACM removed shall be immediately bagged and/or wrapped, kept wetted and transferred to a closed receptacle no later than the end of the work shift. Material shall not be left on the floor during non-work periods and the work area shall be cleaned at the end of each work shift.

9. A pre-removal inspection is required after set-up of removal area. A final inspection is required after removal and clean-up is complete for each area. All pre-removal and final visual inspections shall be conducted by a representative of 88 ABW/EM and require a minimum of 24 hours notice.

10 The landfill used for disposal shall be EPA approved for all friable and category II non-friable (as defined by 40 CFR 61.141) ACM. Category I non-friable ACM shall be disposed of in a sanitary landfill.

3.02 MONITORING, REPORTING AND CORRECTIVE ACTIONS

A. Background Samples

1. Background samples shall be taken in the work area(s) and in adjacent areas of the building before any set-up or disturbance to access the area of work. One sample shall be taken for every 1250 square feet of each enclosure area prior to any set-up work. Samples shall be taken with 25 mm cassettes by the Industrial Hygiene Technician with a minimum volume of 1200 liters and analyzed by PCM. Sample cassettes shall be saved for future reference.

B. Daily Monitoring

1. Daily samples for NPE shall be taken inside the containment area, (in close proximity to gross removal) in the clean room, at the exhaust of the AFDs, all areas adjacent to the work area and on 25% of the workers with the highest expected exposure. All daily personal samples for non-NPE shall be taken during set-up to completion of work on 25% of the workers with the highest expected exposure.

2. All samples shall be taken with 25 mm cassettes by the Industrial Hygiene Technician with a minimum volume of 1200 liters (except for personal and work area samples). Air sampling pumps shall be calibrated before and after each sample. Only personal samples shall be analyzed on-site. All other daily samples shall be analyzed in the approved laboratory by PCM within 16 hours and the results shall be reported to the Industrial Hygiene Technician

or Competent Person. The Industrial Hygiene Technician or Competent Person shall post all air monitoring results in an area accessible to building occupants within 24 hours.

3. Each set of samples taken shall include 10% field blanks or a minimum of 2 field blanks. These blanks must come from the same lot as the filters used for sample collection. The field blank results shall be averaged and subtracted from the analytical results before reporting. A set consists of any sample or group of samples for which an evaluation for this standard must be made. Any samples represented by a field blank having a fiber count in excess of the detection limit of the method being used shall be rejected.

4. The Industrial Hygiene Technician or competent person shall immediately notify 88 ABW/EM and the Contracting Officer if any samples show fiber counts exceeding the Permissible Exposure Level (PEL) inside the containment area or exceeding 0.01 fibers per cubic centimeter (f/cc) outside the containment area.

C. Final Clearance Sampling

1. Prior to clearance sampling and encapsulation, 88 ABW/EM shall conduct a final visual inspection. All surfaces within negative pressure enclosures shall be clean and dust free. If any residue, dust or debris is found, the area shall be recleaned and reinspected at the contractor's expense.

2. All final clearance samples shall be taken by the Industrial Hygiene Technician with the containment intact and air filtration devices still in operation. Final air clearance shall not begin until encapsulant has set at least two hours and dry after application.

3. Final clearance sampling shall be performed while air is being circulated within the area and after air has been directed at all horizontal surfaces from the exhaust of an electric leaf blower. The following number of final air samples shall be taken per square footage of each negative pressure enclosure or fraction thereof: sq footage shall equal the total of all ploy walls and floor or inside exposed enclosure walls and floor.

   a. For enclosures less than 500 square feet (sq ft), 3 PCMs required.

   b. For enclosures 500 sq ft - 3750 sq ft, 3 PCMs and 1 TEM required

   c. For enclosures greater than 3750 sq ft, 1 PCM for every 1250 sq ft of enclosure and 1 TEM required.

4. The Ohio Department of Health (ODH) requires a minimum of three samples be analyzed by the PCM method for every NPE. The following requirements are in addition to the ODH requirements for final clearance sampling. One final clearance sample shall be analyzed by the TEM method for every NPE greater than 500 sq ft. If any fiber counts exceed 0.005 structure/cc for samples analyzed by TEM or 0.010 fibers/cc for samples analyzed by PCM the area shall be recleaned and resampled at the Contractor's expense.

5. All PCM samples shall be conducted in accordance with NIOSH Method 7400, entitled "Fibers," published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987. All pumps shall be calibrated for a maximum flow rate of 600 liters per hour (l/h) for background, area and final air sampling.

6. All TEM samples shall be conducted in accordance with the regulations established by the United States Environmental Protection Agency, in 40 CFR, Part 763, Subpart E, Appendix

A. All pumps shall be calibrated for a maximum flow rate of 600 liters per hour (l/h) for background, area and final air sampling.

7. Negative pressure enclosure, decontamination units and critical barriers shall only be removed following receipt and approval of the signed written laboratory analysis of the final clearance sampling by 88 ABW/EM. The preliminary faxed results shall be signed by the laboratory technician and sent from the performing laboratory. The preliminary report shall also include the name of the abatement contractor, building number, room/containment number, sampling date, and date of analysis.

8. The government shall reserve the right to perform independent final clearance air sampling and adjacent area monitoring to determine compliance with this specification.

3.03 WORK SUSPENSION

A. The Contractor shall be subject to on-site inspection by a Government representative or regulator who may be assisted by safety or health personnel. If work is in violation of specification requirements, the Contracting Representative shall temporarily suspend work and notify the Contracting Officer who may verbally, or in writing, issue a stop work order. Standby time and expenses required to resolve the violation shall be at the Contractor's expense. Examples include but are not limited to:

1. Improper notification,

2. Dry removal of ACM,

3. Visible emissions,

4. Improper disposal,

5. Competent person not present,

6. Inadequate personal protection,

7. Inadequate negative pressure,

8. Violation of air monitoring procedures,

9. Deviation of the approved work plan.

10. IH Technician or AMT not present during removal or final air sampling.

END OF SECTION

SECTION 02090

REMOVAL AND DISPOSAL OF PAINT CONTAINING LEAD MATERIAL (OSHA COMPLIANCE)

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The work for this section includes removal and management of paint containing lead including all labor, materials and equipment required to protect all personnel from exposure to lead.

B. The OSHA Lead Construction Standard, 29 CFR 1926.62, is in effect whenever materials are disturbed that contain any amount of lead. This will require contractors disturbing painted or coated surfaces to institute medical surveillance, training, engineering controls, worker protection measurers and employee monitoring until monitoring results per the lead paint standard demonstrate that employee exposure is below the action level and permissible exposure limit. All documentation regarding lead exposure either by historical data or project data must be maintained by the contractor and on site.

1.02 APPLICABLE PUBLICATIONS

A. The publications listed below are part of this specification.

1. Environmental Protection Agency, EPA: Title 40 Code of Federal Regulations, Part 260 through 302.

2. Occupational Safety and Health Administration, OSHA: Title 29, Code of Federal Regulations, Part 1910 through 1926

3. Department of Transportation, DOT: Title 49, Code of Federal Regulations, Sections 171 through 178

4. Underwriters Laboratories, Inc., (U.L.): U.L. 586, High Efficiency, Particulate, Air Filter Units

1.03 QUALIFICATIONS

A. The contractor shall have experience in properly removing lead paint according to EPA rules and OSHA standards.

B. Training: Train each employee performing paint removal and air sampling operations prior to the time of initial job assignment, in accordance with 29 CFR 1926.62 and it's appendices.

C. All workers performing lead abatement/removal will be required to have an Ohio Department of Health, Lead Workers License.

1.04 PERFORMANCE REQUIREMENTS

A. The contractor shall utilize an industrially accepted method of lead based paint removal. This is subject to concurrence from The Office of Environmental Management, 88 ABW/EM.

B. The contractor shall incorporate methods to insure the containment of airborne, falling paint chips, dust and liquids generated during this project.

C. The contractor shall properly manage all hazardous materials in accordance with all Air Force and WPAFB specific policies and regulations.

D. The contractor will be responsible for collection of all lead paint removal wastes and proper storage of that waste on site. Paint wastes (chips, etc.) shall be stored separately from the associated lead paint materials (absorbent material, disposable clothing and tools, etc.). The contractor will turn this collected paint chips over to the 88/EM representative.

E. The contractor shall perform demolition work without damage or contamination of adjacent work areas. Where such areas are damaged or contaminated, the contractor will restore the work areas to their original condition at contractors expense.

F. The contractor shall have one copy of all applicable publications listed in paragraph 1.02, copies of the approved work plan, and WPAFB specification Section 02090 available at the job site at all times.

G. The contractor will be qualified to wear appropriate personal protective equipment, will perform necessary monitoring and will ensure other personnel in the general work area are adequately protected from hazards generated by the contractor.

H. The contractor will be qualified to handle and manage hazardous waste in accordance with the Resource Conservation and Recovery Act.

1.05 DEFINITIONS

A. Action Level: Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period. As used in this section, "30 micrograms per cubic meter of air" refers to the action level.

B. Area Monitoring: Sampling of lead concentrations outside the lead control area to ensure that the airborne lead is being contained within the controlled area.

C. Certified Industrial Hygienist (CIH): As used in this section, refers to an Industrial Hygienist employed by the Contractor and certified by the American Board of Industrial Hygiene in comprehensive practice.

D. Change Rooms, Hand-Washing Facilities and Shower Facilities: Rooms within the designated physical boundary around the lead control area equipped with separate storage facilities for clean protective work clothing and equipment and for street clothes which prevent cross-contamination.

E. Competent Person: Is defined as a person who has successfully completed a Lead Abatement Supervisor Course which utilizes the current USEPA approved curriculum and a person who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measure to eliminate them.

F. Decontamination Unit: Rooms for removal of contaminated personal protective equipment (PPE) and personnel (e.g. clean room, shower and dirty room).

G. Eight-Hour Time Weighted Average (TWA): Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.

H. Hazardous Waste: A solid waste or combination of solid wastes which meets one of four conditions:

1. Exhibits a characteristic of hazardous waste (40 CFR Sections 261.20-262.24)

2. Has been a listed hazardous waste (40 CFR 261.31 through 261.33)

3. Is a mixture containing a listed hazardous and a non-hazardous solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste).

4. Is not excluded from regulation as a hazardous waste.

I. High Efficiency Particulate (HEPA) Filter Equipment: HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

J. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.

K. Lead Based Paint (LBP): Paint with any detectable amount of lead.

L. Lead Control Area: An isolated area or structure with full containment to prevent the spread of lead dust, paint chips or debris of lead-containing paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

M. Lead Permissible Exposure Limit (PEL): Fifty micrograms per cubic meter of air as an 8-hour weighted average, as determined by 29 CFR 1926.62. If an employee is exposed for more than 8 hours in a work day, the PEL shall be determined by the following formula:

PEL (micrograms/cubic meter of air) = 8/no. of hrs worked per day

N. Personal Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and the center at the nose or mouth of an employee.

O. Physical Boundary: An area physically partitioned off around an enclosed lead control area to limit unauthorized entry of personnel.

P. Toxicity Characteristic Leaching Procedure (TCLP): Has replaced the Extraction Procedure Toxicity Test (EP) as the laboratory test used to determine the toxicity of material making up the waste stream.

1.06 QUALITY ASSURANCE

A. Medical Examinations: Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1926.62. The examination will not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62 within the last year.

B. Respiratory Protection Program:

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every six months thereafter as required by 29 CFR 1926.62.

2. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1910.134, 29 CFR 1926.62 and 29 CFR 1926.55.

C. Hazard Communication Program: Establish and implement a Hazard Communication Program as required by 29 CFR 1910.1200 and 29 CFR 1926.59.

D. Procedures for container management:

1. Maintain an inventory of waste containers and empty containers.

2. All containers must be labeled in accordance with the following:

a. Each container shall be individually labeled. Labels shall be filled out legibly with a waxed based pencil (note: grease pencil) or other marking pen (note: Sharpie Pen) capable of withstanding diverse climate/weather conditions (Note: pen shall resist fading and streaking). Ball-point pens, pencils and magic markers are not acceptable.

b. All containers shall have one of the following acceptable labels properly filled out and in good condition displayed:

1). LEAD PAINT ABATEMENT ACCUMULATION CONTAINER (include Sample Date _____ and Sample Number _____).

2). EMPTY

c. If a label becomes lost, worn, faded or defaced in any manner, the label shall be immediately replaced. Paper labels exposed to adverse weather conditions should be protected with a plastic overlaying to prevent deterioration.

1.07 SITE SPECIFIC WORK PLAN

A. Include a description of each activity in which lead is emitted (e.g.; equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices), a description of the specific means to achieve compliance, air monitoring plan and date, detailed schedule for implementation of the program, work practice program, decontamination procedures, administrative control schedule and description of arrangements made among contractors and DoD personnel on multi-employer worksites.

1. Submit a detailed job-specific plan of the work procedures to be used in the removal of lead-containing paint.

a. The plan shall include a sketch showing the location, size and details of lead control areas, location and details of decontamination rooms, change rooms, shower facilities, hand washing facilities as applicable and mechanical ventilation system.

b. Include in the plan, eating, drinking, smoking and restroom procedures, interface of trades, sequencing of lead related work, collected waste water and paint debris

disposal plan, air sampling plan, respirators, protective equipment and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded outside of the lead control area.

c. All collected waste water will be filtered through a 5 micron filter and then tested by TCLP. If test proves water to be non-hazardous, water may be disposed of by way of a sanitary drain, but only after receiving approval from 88 ABW/EM or their representative.

2. Contain all solid material (used absorbent material, paint chips, removed soil, disposable tools, etc.) in 30 gallons or less open head steel shipping drums. The Department of Transportation approved drums shall meet DOT 17C specifications and must be in good condition.

3. Prior to adding lead containing waste into drums, contractor will line drum with two six mil poly bags.

4. All drums will be maintained in a secure area or must have bung locks.

5. Include air sampling, training and strategy, sampling methodology, frequency, duration of sampling and qualifications of air monitoring personnel in the air sampling portion of the plan. Obtain approval from 88 ABW/EM of the plan prior to the start of paint removal work.

1.08 PERMITS AND NOTIFICATIONS

A. The contractor shall be responsible for obtaining all legally required permits for the removal and management of lead paint waste. The contractor also shall be responsible to comply with notification requirements of the Ohio Department of Health as the law requires. Send notification, if required, to the following address: Ohio Department of Health, Division of State Environmental Services, P.O. Box 18, Columbus, Ohio, 43244-0118. A copy of notification should be forwarded to 88 ABW/EMC, Attention: LBP Program Manager.

1.09 PRE SUBMITTALS

A. Submit a Project Work Plan for approval in accordance with Section 01300. This plan shall include:

1. A completed copy of the Submittal Checklist.

2. A site specific work plan satisfying the criteria of 29 CFR 1926.62 (see Section 1.07).

3. A list of disposal sites to be used for disposal of non-hazardous waste (construction debris) including applicable permits or licenses.

4. An inventory of hazardous materials to be used for lead during this project. Include name of product, size/volume of container and quantities of materials to be used. Additionally, Material Safety Data Sheets (MSDS) shall be submitted for each material used. Inventories and MSDSs must be submitted to 88 ABW/EM and updated as information changes.

B. Statements

1. Qualifications of CIH (if applicable),

2. Testing laboratory qualifications and laboratory quality control program,

3. Safety program,

4. Name and address of companies providing rental equipment,

5. Respiratory protection program,

6. Hazard communication program,

7. Medical surveillance program,

8. Proof of insurance,

9. Employees LBP training certificates,

10. List and identification of projects where citations for LBP violations occurred.

C. Testing Laboratory: Details required for submittal of testing laboratory:

1. Submit the name, address and telephone number of the testing laboratory selected to perform the testing and reporting of airborne concentrations of lead.

2. Provide proper documentation that persons performing the analysis have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) program.

3. The laboratory shall be accredited by the American Industrial Hygiene Association (AIHA). Provide AIHA documentation along with date of accreditation/reaccreditation.

4. Submit the name, address and telephone number of analytical laboratory selected to analyze waste streams generated from this project. Laboratories must perform analyses in accordance with EPA Method SW-846 and have an established quality assurance/control program.

1.10 POST SUBMITTAL

A. Field Test Reports: Monitoring Results.

B. Air Monitoring: Submit monitoring results within 96 hours after completion of lead abatement, signed by the testing employee performing the air monitoring, the laboratory employee that analyzed the sample and the CIH.

C. Records:

1. Completed and signed Bill of Lading for all non-hazardous waste shipped from WPAFB.

2. Submit laboratory analytical reports including chain of custody forms within 96 hours after completion. Analytical reports shall be certified, dated and signed by the laboratory manager/director.

1.11 COORDINATION

A. After submittals have been approved the contractor shall notify the following in writing at least three working days prior to starting any work that could disturb lead based paints or coatings.

1. 88 CEG/CEC Contract Management (Project Inspector).

2. 88 ABW/EMC Office of Environmental Management (Waste Management Branch).

B. The names of the personnel to be notified will be given to the contractor at the pre-construction meeting.

PART 2 - PRODUCT

2.01 MATERIALS

A. All materials and manufactured units utilized in the lead paint removal process shall meet the requirements of all applicable publications (federal, state and local) including all mandatory appendices. Materials shall also meet the recommendation of the non-mandatory appendices as though the recommendations were mandatory.

PART 3 - EXECUTION

3.01 REMOVAL PROCEDURES

A. All procedures shall conform to the requirements of 40 CFR 262, 29 CFR 1926.62, and all mandatory appendices and the recommendations of their non-mandatory appendices.

B. Contractor shall be responsible for setting up an appointment with 88 CEG/CECP/CECW for pre-inspections and clearances with a minimum of a 24 hour notice. This pre-inspection is required after setup of abatement area and before removal begins.

C. Equipment: Furnish the EMC representative with two complete sets of personal protective equipment daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area.

D. Special Protective Clothing: Furnish personnel who will be exposed to lead-contaminated dust with appropriate disposable protective whole body clothing, head covering, gloves and foot coverings. Furnish appropriate disposable plastic or rubber gloves to protect hands. In order to reduce the level of personal protection the contractor must have EMC approval. The contractor will submit to EMC by task, background information and air monitoring data for approval.

E. Rental Equipment Notification: If rental equipment is to be used during lead-containing paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to 88 ABW/EMC.

F. Boundary Requirements: Provide physical boundaries around the lead control area by roping off the area or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

G. Heating, Ventilating and Air Conditioning (HVAC) Systems: Shut down, lock out, and isolate HVAC systems that supply, exhaust, that pass through the lead control areas. Seal intake and

exhaust vents in the lead control area with 6-mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

H. Change Room, Hand Washing Facility and Shower Facilities: Provide clean change rooms and shower facilities within the physical boundary around the designated lead control area in accordance with requirements of 29 CFR 1926.62. Shower waste water will be filtered through a 5 Micron filter before disposal into a sanitary drain (refer to 1.07.1C.).

I. Mechanical Ventilation System, as applicable.

1. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.57.

2. Use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by 88 ABW/EMC. Local exhaust ventilation systems shall be designed, constructed, installed and maintained in accordance with ANSI Z9.2.

3. If air from exhaust ventilation is recirculated into the work place, the system shall have a HEPA filter with reliable back-up filter. Air may be recirculated only where exhaust to the outside is not feasible.

J. Personnel Protection: Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking or drinking is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been given appropriate training and protective equipment.

K. Warning Signs: Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

L. Work Procedures: Perform removal of lead-containing paint in accordance with approved lead-containing paint removal plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-containing paint is removed in accordance with 29 CFR 1926.62, except as otherwise specified herein.

M. Personnel Exiting Procedures: Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

1. HEPA Vacuum themselves off, to include disposable suits. After vacuuming disposable suits they will be disposed of as construction debris.

2. Remove protective clothing (gloves, coveralls, etc.) in the decontamination room and place them in an approved controlled container.

3. Wash hands and face at a minimum and shower, if applicable, per task, per 29 CFR 1926.62.

4. Change into clean clothes prior to leaving the physical boundary designated around the lead-contaminated job site.

N. Monitoring: Monitoring of airborne concentrations of lead shall be in accordance with 29 CFR 1926.62 and as specified herein. Air monitoring, testing and reporting shall be performed by an Air Monitoring Technician (AMT) or an Industrial Hygienist Technician (IHT).

1. The AMT or IHT shall be on the job site monitoring the lead-containing paint removal task to ensure that the requirements of 29 CFR 1926.62 have been satisfied. Should the contractor change work practices/methods or an employee for a lead task, the contractor will remonitor for that task.

2. Take personal air monitoring samples on employees by task who are anticipated to have the greatest risk of exposure as determined by the competent person.

3. Initial air monitoring is required on all projects as described in 3.01.14. The use of historical data collected from LBP projects performed outside WPAFB is prohibited. Historical data collected from LBP projects at WPAFB may be submitted to 88 ABW/EMC for approval. If approved, this data may be used for the purpose of reduction of PPE.

4. Sufficient area monitoring shall be conducted at the physical boundary to ensure unprotected personnel are not exposed above 30 micrograms per cubic meter.

5. Submit results of personal air monitoring samples within 24 hours after the air samples are taken. Notify the EMC representative immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.

   a. The Competent Person shall review the sampling data collected on that day to determine if condition(s) require any further change in work methods. Changes from approved submittal requires resubmittal and approval before implementing changes. Removal work shall resume when approval is given by 88 ABW/EMC.

   b. If the outside boundary lead levels are at or exceed 30 micrograms per cubic meter of air, work shall be stopped and the contractor shall immediately correct the condition(s) causing the elevated levels and notify the Contracting Officer immediately.

6. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area.

O. Selection: Select paint removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-containing paint removal plan, and approved by 88 ABW/EMC.

3.02 DAILY CLEANUP

A. Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. **Do not dry sweep or use compressed air to clean up the area.** At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping or wiping with water and/or tri sodium phosphate solution in water.

3.03 FINAL INSPECTION

A. The final visual inspection will be performed by 88 ABW/EMC representative. The contractor must provide a minimum of 24 hour notice for all inspections.

B. Do not remove the lead controlled area barriers, roped-off boundary or warning signs prior to approval from 88 ABW/EMC.

1. After wipe samples have been performed and approved by 88 ABW/EMC the contractor may proceed with tear down.

2. Should samples fail the contractor must reclean areas until wipe sample results are below HUD guidelines.

C. All polyethylene used on the project will be vacuumed off and wet wiped before disposal as construction debris.

D. Contractor will wet wipe all surfaces in the lead controlled removal area, Surfaces will be dust free, If the final visual inspection fails the contractor will reclean the area, and re-schedule an additional final visual inspection by 88 ABW/EM Representative .

3.04 WORK STOPPAGE

A. The contractor shall be subject to on site inspection by a government representative who may be assisted by safety or health personnel.

B. If work is in violation of specification requirements or federal or state regulations, the Contracting Representative shall temporarily suspend work and notify the Contracting Officer who may verbally or in writing, issue a stop work order. Standby time and expenses required to resolve the violation shall be at the contractor's expense. Examples include but are not limited to:

1. Improper notification

2. Visible emissions

3. Improper disposal

4. Competent person not present

5. Inadequate personal protection

6. Deviation of the approved work plan

7. Improper hazardous waste management.

3.05 PREPARATION FOR TURN-IN

A. Prepare all lead paint items (paint chips, etc.) for turn-in to the 88 ABW/EM representative. All turn-ins require a 24 hour notice.

END OF SECTION

SECTION 02110

DEMOLITION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Removal of main water line in the basement of Buildings 18C and 18E.

1.02 WORKMANSHIP

A. All demolition shall be done in a carefully and orderly manner. The contractor shall adhere to all governing safety standards in providing safe removal of all items.

B. The contractor shall be responsible for the dismantling, demolition, and disposition of existing work to be removed and the restoration of existing work to its prior condition where joining or connecting to new work or where damaged to existing has occurred during the installation of new work.

C. All cutting, patching, fitting, and finishing of existing work shall be done as necessary to accommodate other work. Work temporarily removed for the installation of new work shall be built back in place, or modified as the case requires. No unfinished surfaces shall be left exposed but shall be finished to conform with adjacent or similar work. Finish generally shall match that of adjacent or similar surfaces and shall include painting.

D. Provide and place bracing or shoring as required to support structure.

1.03 PROTECTION

A. All demolition work shall be done in a manner such that existing sound materials or other building parts shall not be damaged.

1.04 TITLE TO PROPERTY

A. All material and equipment removed shall be considered scrap, will become the contractor's property and shall be removed from Government property. Debris shall be disposed of in accordance with all Federal, State, and local regulations on health, safety, and environmental quality.

1.05 REMOVALS

A. All removals necessary to accomplish the new work are to be considered part of the contract and included in its bidding, whether specified, shown on the drawings or not. A careful inspection of the premises prior to bidding shall be made by each bidder.

1.06 SPECIAL CONDITIONS

A. Reroute any interrupted utility service such as electrical conduit, telephone, water that may be encountered in connection with demolition/repair of work stated in this contract. Abandoned utilities will be removed as per direction of architect/engineer.

B. It shall be noted that the building and areas under contract for work to be performed will NOT be vacated during execution and completion of contract. The contractor shall coordinate the schedule

of work with the using agency or agencies and the contracting officer's representative so as not to restrict normal daily operations or impede traffic beyond that which is deemed necessary. The contractor shall keep noise, dust, and dirt to a minimum.

END OF SECTION

SECTION 15010

MECHANICAL PROVISIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work covered by sections 15000 to 15999 which are included in this specification consists of furnishing all plant, labor, equipment, appliances, devices and materials, and performing all operations necessary to make project operational as herein specified and as shown, indicated, or noted on the drawings and specifications.

1.02 DEFINITIONS

Remove: Disconnect, dismantle or disconnect and dismantle as necessary. All removals not designated for reuse nor designated to be salvaged for the Government is property of contractor. Dispose of removals outside of Wright Patterson Air Force Base.

Provide: Furnish new, install, and make operational in location indicated or specified.

Replace: Remove existing and provide new as indicated in same location.

Coordinate: Locate to avoid (both existing and new) equipment, services, and obstructions.

Reroute: Remove parts of system and provide extension to system to circumvent new obstruction.

Relocate: Remove existing, install existing in different location indicated and make operational.

Reinstall: Remove existing, install existing in same location and make operational.

Rough-in: The installation of all parts of the plumbing, heating, ventilation, and air conditioning system which can be completed prior to the installation of fixtures, diffusers, ceiling, and other final finish appurtenances.

1.03 DRAWINGS

A. Consult all contract drawings which may affect the locations of any equipment, apparatus, piping and ductwork and make minor adjustments in location to secure coordination and maintenance accessibility.

B. The layout shown on the drawings is schematic and exact locations shall be determined by structural and other conditions and verified in the field. This shall not be construed to mean that the design of the system may be changed, it refers only to the exact location of piping and ductwork to fit into the building as constructed, and to coordination of all work with systems and equipment included under other divisions of the specifications.

C. The Contracting Officer reserves the right to make minor changes in the location of pipe up to the time of rough-in without additional cost to the Government.

D. Due to the scale of the drawings, it is impossible to show all offsets, elbows and transitions which may be required. The Contractor shall carefully investigate the conditions affecting all work and

shall furnish all elbows, fittings, transitions, etc., required to accomplish the desired result at no additional cost to the Government.

E. Verification of Dimensions: The Contractor should visit the premises before date of invitation for bids/request for proposals and thoroughly familiarize himself with all details of the work and working conditions and verify all dimensions in the field, and shall advise the contracting officer of any discrepancies before above date. The contractor shall be specifically responsible for the coordination and proper relation of his work to the building structure and to the work of all trades.

F. Where drawings indicate a component is to be replaced, provide extensions of all existing connections of similar material, capacity, size and locate components to secure full operational capabilities.

1.04 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Provide five complete sets of operating and maintenance instructions for the equipment and systems. Provide at project close-out time.

1. Each set shall be provided with a standard 3-ring hard bound cover, notebook. Provide for 8-1/2"x11" notebook paper.

2. Notebook shall have following organization:

a. Title page with same information as title block of contract drawings. The top of title page shall have the inscribed words "OPERATION AND MAINTENANCE INSTRUCTIONS".

b. A table of contents listing specific systems and instructions provided.

c. 8-1/2"x11" notebook indexes with tabs displaying each line item listed in table of contents. Provide indexes with reinforced edge quality.

d. Large sheets of drawings shall be punched and folded into notebook.

B. The operating and maintenance instructions shall include but not be limited to:

1. System layout showing piping and valves. Contract documents with field changes are acceptable.

2. Operating and maintenance instructions for each piece of equipment, including lubrication instructions.

3. Manufacturer's bulletins, cuts and descriptive data.

4. Parts lists and recommended spare parts.

5. Provide all maintenance repair and overhaul data; text or descriptive literature. If in manual form submit as such. PROVIDE INFORMATION EQUIVALENT TO ALL DESCRIPTIVE LITERATURE ACCESSIBLE TO THE MANUFACTURER'S AUTHORIZED SERVICE REPRESENTATIVE.

6. Lists of unique tools needed for complete maintenance of unit.

7. Copy of approved submittals requested for components of that respective system.

8. Copy of Backflow Prevention Devices Submittal. Including specific location, drawings, model, type, size, manufacturers maintenance schedule, and Ohio EPA testing requirements.

1.05 PROJECT CLOSE-OUT

A. At project close-out, Section 01015, Paragraph 1.14, submit the following record documents.

1. Five copies of operation and maintenance data.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. Capacities of all equipment shall meet or exceed those specified. Any equipment that is expected to operate 25 percent or more above the specified capacity shall be submitted for approval.

B. Catalog numbers listed in the specifications do not necessarily have complete prefix and suffix designations for placing equipment order. Contractor shall verify catalog numbers and amend the numbers as required to achieve an operational installation.

2.02 MANUFACTURER

A. Material and equipment shall be standard products of the manufacturer's latest design and available to perform the functions intended.

B. Manufacturer shall have produced similar equipment and material for a period of at least 2 years.

C. Similar installations using manufacturer's equipment and material shall exist. Installations shall be rendering satisfactory service.

2.03 CONFORMANCE TO AGENCY REQUIREMENTS

A. Where materials or equipment are specified to be constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers; the Air Conditioning and Refrigeration Institute; or the American Society of Heating, Refrigerating and Air Conditioning, Engineer or other testing agency, the contractor shall submit proof of such conformance, if requested by the Contracting Officer's Representative.

B. Proof of such conformance shall be provided by one of the following:

1. A written certificate from a nationally recognized testing agency, adequately equipped and competent to perform such services. Certificate shall state the methods of testing and that the units conform to the applicable performance requirements of these specifications. Provide agencies letterhead on certificate.

2. Manufacturer shall submit an applicable computer product selection printout. Printout shall possess manufacturer's certified test data (from standards) and manufacturer's letterhead.

3. The label or listing of the agency as part of the manufacturer's standard catalog and publication's data.

4. A published statement from the manufacturer. Statement shall possess the following minimal requirements:
   a. A listing of all applicable performance requirements specified.
   b. Addressed to both contractor and Government Contracting Officer.
   c. The manufacturer's letterhead.
   d. The Government contract number.
   e. The standards to which the manufacturer's product conform.
   f. The means of certification testing etc. that the manufacturer warrants to conform to the above standards.
   g. A signature from a person in the manufacturer's organization who holds legal agent status of the respective manufacturer.

2.04 NAMEPLATES

A. Each major item of equipment shall have the manufacturer's name, serial and model numbers on a plate securely attached to the item.

2.05 SAFETY REQUIREMENTS

A. Belts, pulleys, chains, gears, couplings, projecting set screws, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. Items such as platforms shall be provided where indicated for safe operation and maintenance of equipment.

PART 3 - EXECUTION

3.01 MANUFACTURER

A. Unless otherwise specified or indicated, install material and equipment in accordance with the recommendations of the manufacturer, as approved by the contracting officer, to conform with the contract documents.

3.02 SKILLS

A. Have installation accomplished by workmen skilled in the required type of work.

3.03 SUPPORT

A. Channel, cut, chase or drill floors, walls, partitions, ceilings or other surfaces as required to install support or anchor material and equipment.

B. Do not support material or equipment from sheet steel.

3.04 WELDING

A. The contractor shall be responsible for the quality of welding done. Refer to Section 15020 - Qualifications of Welding Procedures and Welders.

3.05 WORKMANSHIP

A. Materials and equipment shall be installed to conform with the contract document, in accordance with the approved recommendations of the manufacturer and the applicable standards.

3.06 REPAIRS

A. Do not deface items furnished with finished surfaces by manufacturer. Clean and repair damaged items to original finish.

B. Skilled mechanics of the trade involved shall repair damage to building, piping or equipment caused by work.

C. Patch holes caused by removal or installation of equipment and material. Finish patched areas to match surrounding areas.

D. Provide filling materials similar to existing structural material or smoke and fire stop fittings for openings in walls, ceiling and floors. Filling materials or fittings shall not degrade fire rating of surrounding material. Filling materials shall not allow passage of smoke, fire, water, or fumes.

E. Where removed items leave unfinished or damaged finished surfaces exposed, finish those surfaces to match existing adjacent surfaces.

3.07 DRAIN LINES

A. Provide drain line with integral air gap from all backflow prevention devices. Drain line to run to nearest convenient floor drain unless shown otherwise.

B. All strainers to have tapped blowdown connection 20mm (3/4") minimum; install gate valve and blowdown pipe with hose connection.

3.08 CAPPING PIPING AND DUCTWORK

A. Where part of an existing pipe/ductwork is to be removed and no new piping/ductwork or equipment are connected to the remaining pipe/ductwork, it shall be capped.

B. If a new pipe/ductwork is shown with an open end it shall be capped unless shown otherwise.

3.09 FIELD INSTRUCTIONS

A. Upon completion of the work and at a time designated, the services of one or more service engineers shall be provided by the Contractor to instruct the representative(s) of the government in the operation and maintenance of the new systems. These field instructions shall cover all the items contained in the bond instructions. The minimum number of hours for field instruction shall be as follows:

Type of System	Time (Hrs)
Piping, valves and fittings	4

3.10 INSPECTION OF MECHANICAL SYSTEMS

A. At a minimum there shall be two milestone inspections for plumbing and other mechanical work. These milestone inspections shall be coordinated with all the incremental inspections required by the specifications. The contractor shall ensure all necessary work is completed and checked for conformance to the specification prior to requesting the inspection. The Contracting Officer and/or his representative will conduct the inspection within a reasonable period of time after the request (usually 24 hours). The request can be made to the Contracting Officer verbally. All items noted as deficient by the inspection shall be corrected by the Contractor prior to a request for re-inspection. The Contracting Officer will then respond in the named time limits for the re-inspection. The inspections shall be as follows.

1. Rough-In-Inspection: Will be requested at the time all mechanical work is completed but prior to being covered by finish wall, ceiling, and floor materials. Typically plumbing and piping systems will be installed and hydrostatically tested as required. All joints, connections and the devices will be visible and accessible for inspection. Should any segment of the system be covered so as to prevent such inspection, the contractor shall expose the system for the Contracting Officer. Once the inspection is completed and Contracting Officer accepts the work the contractor may proceed with construction and finish all work. The contractor will be informed in writing that all work is acceptable.

2. Finish Inspection: Will be requested when all systems are completed, tested and ready for normal operations. This inspection shall be done prior to the contractor requesting the overall project pre-final inspection. Plumbing and other piping systems will be pressurized with all finished fixtures and trim in place. The Contractor will not request the pre-final inspection until the Finish Inspection is completed.

3.11 WARRANTY PERIOD

A. The contractor shall be responsible for providing a 24 month warranty on all equipment specified in Division 15, including all internal and external associated parts with such equipment, and the installation of all equipment. The warranty shall cover both labor and material for the full warranty period.

END OF SECTION

SECTION 15020

QUALIFICATION OF WELDING PROCEDURES AND WELDERS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Contractor shall provide typed, welding procedures, and certification of welders (welders must be current in their certification for this type of work) to meet the applicable sections of ASME Boiler and Pressure Vessel Code, Section IX.

B. Applicable Pressure Vessel/Piping System

1. Piping

(a) Steel Water Piping

1.02 DEFINITIONS

A. Welding is defined as the process of joining two metals by heat or pressure.

1.03 REFERENCE STANDARDS

A. Qualifications and procedures shall be based on ASME Boiler and Pressure Vessel Code, Section IX.

1.04 SUBMITTALS

A. Type of welding to be used for the piping system(s) involved in the project.

B. Listing of the applicable sections of ASME Section IX for each piping system.

C. Welding Procedures as required by ASME Boiler and Pressure Vessel Code, Section IX. Test certificate as required by ASME Section IX for the specific type of weld to be used.

PART 2 - PRODUCTS

NONE

PART 3 - EXECUTION

3.01 INSTALLATION

A. Each weld performed shall be identified with the welder's specific code mark signifying his name and number assigned.

END OF SECTION

SECTION 15022

CAULKING AND SEALANTS FOR MECHANICAL WORK

PART 1 - GENERAL

1.01 SCOPE

A. Provide caulking and sealants for mechanical work in exterior and interior walls.

1.02 APPLICABLE PUBLICATIONS

A. Federal Specifications (Fed. Spec.)

TT-C-00598C Caulking Compound, Oil and Resin Base Type (For Bldg. Construction)

TT-S-00227E Sealing Compound: Elastomeric Type, Multi & Component (For Caulking, Sealing, and Glazing in Buildings and Other Structures)

TT-S-00230C Sealing Compound: Elastomeric Type, Single Component (For Caulking, Sealing, and Glazing in Bldgs & Other Structures)

TT-S-001543A Sealing Compound: Silicone Rubber Base (For Caulking, Sealing, and Glazing in Buildings and Other Structures)

TT-S-001657 Sealing Compound-Single Component, Butyl Rubber Based, Solvent Release Type (For Bldgs. & Other Types of Construction)

B. American Society for Testing and Materials (ASTM) Publications:

D 217 Cone Penetration of Lubricating Grease

1.03 GENERAL REQUIREMENTS

A. Caulking and sealants shall be provided in joints as required. The joint design, shape, and spacing shall be as indicated and specified. Mixing shall be in accordance with instructions provided by the manufacturer of the sealants.

1.04 ENVIRONMENTAL REQUIREMENTS

A. The ambient temperature shall be within the limits of 40 to 90 degrees F. when the caulking and sealants are applied.

1.05 DELIVERY AND STORAGE

A. Materials shall be delivered to the job in the manufacturer's original unopened containers. The containers shall include the following information on the label: supplier, name of material, formula or specification number, lot number, color, date of manufacture, mixing instructions, shelf life, and curing time when applicable at the standard conditions for laboratory tests. Caulking compound or components outdated as indicated by shelf life shall not be used. Materials shall be carefully handled and stored to prevent inclusion of foreign materials or exposure to temperatures exceeding 90 degrees F. Sealant tape shall be handled and stored in a manner that will not deform the tape.

PART 2 - PRODUCTS

2.01 BACKFILL MATERIAL

A. Backstop material shall be resilient urethane or polyvinyl-chloride foam, closed-cell polyethylene foam, closed-cell sponge of vinyl or rubber, polychloroprene tubes or beads, polyisobutylene extrusions, oilless dry jute, or rope yarn. Backstop material shall be nonabsorbent, nonstaining, and compatible with the sealant used. Tube or rod stock shall be rolled into the joint cavity. Pre-formed support strips for ceramic and quarry tile control-joint and expansion-joint work shall be polyisobutylene or polychloroprene rubber.

2.02 NO. 2 SEALANT

A. No. 2 sealant shall be a two-component, Elastomeric type compound conforming to Fed. Spec. TT-S-227, Type II, Class (A) (B). The compound shall be supplied in pre-measured for on-the-job mixing.

2.03 NO. 4 SEALANT

A. No. 4 sealant shall be a one component, Elastomeric-type compound conforming to Fed. Spec. TT-S-230, Type II, Class (A) (B) or Fed. Spec. TT-S-1543, Class (A) (B).

2.04 APPLICATIONS OF NO. 2 & NO. 4 SEALANT

A. Sealing compounds conforming to Fed. Spec. TT-S-227, Fed. Spec. TT-S-230, and Fed. Spec. TT-S-1543 should be used on exterior applications for sealing control joints and expansion and other movable joints in concrete, masonry, and metal where cyclic movement is anticipated. These sealants should not be used for sealing on asphalt to asphaltic or bituminous materials; a sealant based on asphalt or bituminous materials similar to those in the membrane should be used. The following listing indicates the types of applications, appropriate for use of sealing compounds. Class A compounds resist to 50 percent total joint movement. Class B compounds resist to 25 percent total joint movement. Joints and recesses formed where frames and subsills, louvers, and vents adjoin masonry, concrete, or metal frames. Use sealing compound at both exterior and interior surfaces of exterior wall penetrations.

B. Masonry joints in which shelf angles occur.

C. Expansion and control joints.

D. Interior face of expansion joints in exterior concrete or masonry walls where no metal expansion joint covers are required.

E. Openings where items pass through exterior walls.

F. Metal reglets when lead caulking rope is not used, where flashing is inserted into masonry joints, or where flashing is penetrated by coping dowels.

G. Metal-to-metal joints where sealing or caulking is shown or specified.

2.05 PRIMER

A. Primer for No. 2 and 4 sealant shall be as recommended by the sealant manufacturer. Primer shall have been tested for durability with the sealant to be used and on samples of the surfaces to be sealed.

2.06 NO. 7 SEALANT

A. No. 7 sealant shall be a polyisobutylene-based or isoprene-isobutylene-based pressure-sensitive tape or bead. When applied between two clean, dry surfaces of specified thickness' and under conditions of continuous pressure that will be encountered in the use specified, the sealant shall seal the joint from water and shall be weather resistant. The material shall be nonbleeding at 160 degrees F and below, shall withstand temperature ranges from minus 30 degrees F to 200 degrees F without loss of adhesion and without slipping and shall have properties allowing the compound to move with the expansion and contraction of the structure. The tape or bead shall contain a cloth or fiber insert. The tape or bead shall be supplied in rolls with a removable paper for cloth backing.

2.07 NO. 10 SEALANT

A. No. 10 sealant shall be treated-typed foamed-urethane strip saturated with a butylene waterproofing material or asphalt-impregnated foamed-polyurethane strip.

2.08 BOND-PREVENTIVE MATERIALS

A. Bond-preventive materials shall be pressure-sensitive adhesive polyethylene tape, aluminum foil or wax paper. At the option of the Contractor, backstop material with bond breaking characteristics may be installed in lieu of bond-preventive materials specified.

2.09 CAULKING COMPOUND

A. No. 1 caulking compound shall conform to Fed. Spec. TT-C-598, Type I. Caulking compounds conforming to Fed. Spec. TT-C-598 should be used on interior applications for caulking joints in wood or masonry, or in the short joints between masonry surfaces, wood surfaces, or metal surfaces where limited movement is anticipated. The listing below indicates the type of applications appropriate for use of oil and resin-base caulking.

1. Openings 1/4 inch and less between walls and partitions and adjacent lockers, casework, shelving, door frames, built-in or surface mounted equipment and fixtures, etc.

2. Joints between metal edge members for acoustical tile and adjoining vertical surfaces.

3. Other interior locations where small voids between materials require filling for first class workmanship and painting.

B. Sealer: Sealer for No. 1 caulking compound shall be aluminum paint.

2.10 APPROVED SEALANTS FOR JOINTS

A. A partial listing of joints and sealants:

Type of Joint	Sealant No.
Pipe sleeve for insulated pipe thru wall above grade	2 or 4

Metal frame around masonry	2

2.11 JOINT DIMENSIONS

A. The minimum joint width for oil-and-resin-base-type caulking should be 1/4 inch, and the depth should be one to three times the width of the joint with the maximum depth being 3/4 inch. The minimum joint width for synthetic rubber-base-type sealant should be in no case less than 1/4 inch. The following chart is a guide for providing effective width-to-depth ratios:

IF JOINT WIDTH IS:	JOINT DEPTH SHOULD BE:	
For Metal, Glass, or Other Nonporous Surfaces:	Minimum	Maximum
1/4 inch (minimum suggested)	1/4 inch	1/4 inch
Over 1/4 inch to 1/2 inch	1/4 inch	Equal to "width"
Over 1/2 inch to 1 inch	1/2 inch	Equal to "width"
Over 1 inch to 2 inch	1/2 inch	1/2 of "width"
Over 2 inch	(Obtain recommendations from sealant manufacturers.)	

Joint should be provided for anticipated movement of not more than 50 percent of joint width with temperature range of not less than 150 degrees F. for metals and 100 degrees F. for other materials.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. General: The surfaces of joints to be sealed shall be dry. Oil, grease, dirt, chalk, particles of mortar, dust, loose rust, loose mill scale, and other foreign substances shall be removed from all joint surfaces to be sealed. Oil and grease shall be removed with solvent and surfaces shall be wiped with clean cloths.

B. Concrete and Masonry Surfaces: Where surfaces have been treated with curing compounds, oil, or other such materials, the materials shall be removed by sandblasting or wire brushing. Laitance, efflorescence and loose mortar shall be removed from the joint cavity.

C. Steel Surfaces: Steel surfaces to be in contact with sealant shall be sandblasted or, if sandblasting would not be practical or would damage adjacent finish work, the metal shall be scraped and wire brushed to remove loose mill scale. Protective coatings on steel surfaces shall be removed by sandblasting or by a solvent that leaves no residue.

D. Aluminum Surfaces: Aluminum surfaces of louvers in contact with sealants shall be cleaned of temporary protective coatings. When masking tape is used for a protective cover, the tape and any residual adhesive shall be removed just prior to applying the sealant. Solvents used to remove protective coatings shall be as recommended by the manufacturer of the aluminum work and shall be non-staining.

3.02 APPLICATION

A. Paper Masking Tape: Paper masking tape shall be placed on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or compound smears. Masking tape shall be removed within 10 minutes after the joint has been filled and tooled.

B. Bond Preventive Materials: Bond-preventive materials for No. 2, 3 and 4 sealant shall be installed on the bottom of the joint cavity and other surfaces indicated to prevent the sealant from adhering to the surfaces covered by the bond-preventive materials. The materials shall be carefully applied to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond-preventative materials.

C. Backstops: The back or bottom of joints constructed deeper than indicated shall be packed tightly with backstop material to provide a joint of the depth indicated. Where necessary to provide a backstop for caulking compound, the joint shall be packed tightly with rope yarn.

D. Primer: Primer shall be used on concrete masonry units, wood, or other porous surfaces in accordance with instructions furnished with the sealant. Primer shall be applied to the joint surfaces to be sealed. Surfaces adjacent to joints shall not receive primer.

E. No. 1 Caulking Compound: Compound shall be gun-applied with a nozzle of proper size to fit the width of joint indicated and shall be forced into grooves with sufficient pressure to expel air and fill the groove solidly. Caulking shall be uniformly smooth and free of wrinkles and shall be left sufficiently convex to result in a flush joint when dry. One coat of sealer shall be applied over joint after compound has dried sufficiently to develop a surface skin so as not to deform the surface of the joint.

F. No. 2, and 4 Sealant: Compound shall be gun-applied with a nozzle of proper size to fit the width of joint indicated and shall be forced into grooves with sufficient pressure to expel air and fill the groove solidly. Sealant shall be uniformly smooth and free of wrinkles. Joints shall be tooled slightly concave after sealant is installed. When tooling white or light-color sealant, dry or water-wet tool shall be used.

3.03 CLEANING

A. The surfaces adjoining the caulked and sealed joints shall be cleaned of smears and other soiling resulting from the caulking and sealing application as work progresses.

END OF SECTION

SECTION 15047

IDENTIFICATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Mark pipes

B. Tag valves

1.02 REFERENCE STANDARDS

A. Military Standards (MIL-STD)

1. MIL-STD-101 Color Code for Pipelines and for Compressed Gas Cylinders.

B. Federal Specifications (FED SPEC.)

1. PPP-T-66 Tape, Pressure Sensitive Adhesive, Vinyl Plastic Film.

2. TT-P-98 Paint Stencil Flat.

C. American National Standards Institute, Inc

1. ANSI A13.1

2. ANSI Z53.1

1.03 ACCEPTABLE MANUFACTURERS

A. Seton

PART 2 - PRODUCT

2.01 PIPE MARKING

A. Colored bands, blocks, pressure sensitive pipe marker shall be used to designate the material being handled. Arrows shall indicate the direction of flow. Upper case letters and arabic numbers shall be used.

2.02 TAGS

A. Shall be brass at least 1-1/2 inches in diameter with depressed black characters 1/2 inch high.

2.03 IDENTIFICATION: EXACT IDENTIFICATION OF THE MATERIAL CONTAINED IN PIPING SHALL BE according to the following tables.

ANSI BAND AND LETTER SIZE

Outside Diameter of Pipe Covering	Width of Color Band	Size of Legend and Numerals
3/4" to 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
3-1/2" to 6"	12"	1-1/4"
8" to 10"	24"	2-1/2"
Over 10"	32"	3-1/2"

ANSI MATERIAL IDENTIFICATION (7)

Material	Title	Band or Color Block Letters	Backgrnd
Potable water	POTABLE WATER	White	Green

(1) Paint all pipe in unfinished areas, block or band in finished areas only.
(2) Colors shall be as recommended in ANSI Z53.1, latest revision, Safety Color Code for Marking Physical Hazards.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Apply markers to straight pipe runs at not over 15 feet spacing, adjacent to valves, at change-in directions, where pipe pass through walls or floors, and be clearly visible from operating position.

B. Where pipes are too small or not readily accessible for such application, a brass tag shall be securely fastened at appropriate locations.

END OF SECTION

SECTION 15094

PIPE HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Pipe hangers and supports.

1.02 REFERENCE STANDARDS

A. Pipe Supports: ANSI B31.1, Power Piping.

B. ASTM A526 - Steel Sheet, Fine Coated (Galvanized) by the Hot Dip Process, Commercial Quality.

PART 2 - PRODUCTS

2.01 INSERTS

A. Inserts: Malleable iron case of (galvanized) steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms.

B. Size inserts to suit threaded hanger rods.

2.02 PIPE HANGERS AND SUPPORTS

A. Hangers: Pipe sizes 1/2 inch (12.7 mm) to 1-1/2 inch (38 mm): Adjustable wrought steel ring.

B. Hangers: Pipe sizes 2 inches (51 mm) to 4 inches (102 mm) and cold pipe sizes 6 inches (152 mm) and over, adjustable wrought steel clevis.

C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods, cast iron roll and stand for hot pipe sizes 6 inches (152 mm) and over.

D. Wall Support: Pipe sizes to 3 inches (76 mm), cast iron hook.

E. Wall Support for Pipe Sizes 4 inches (102 mm) and Over: Welded bracket and wrought steel clamp, adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches (152 mm) and over.

F. Vertical Support: Steel riser clamp.

G. Floor Support for Pipe sizes to 4 inches (101 mm) and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange and concrete pier to steel support.

H. Design hangers to impede disengagement by movement of supported pipe.

I. Threaded rod shall be used for all hangers. “All thread” shall not be used on this project.

J. All pipes are to be independently supported. No pipes are to be hung from other pipes.

2.03 HANGER RODS

A. Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.

PART 3 - EXECUTION

3.01 INSERTS

A. Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams wherever practicable.

B. Set inserts in concrete for all new work. Provide expansion anchors for existing areas.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal steel and copper piping as follows:

Nominal Pipe Size (inch)	Maximum Distance Between Support (feet)	Hanger Rod Diameter (inch)
1/2 (12.7 mm)	6 (1.83 m)	3/8 (9.5 mm)
3/4 to 1-1/2 (19.5-38.1 mm)	6 (1.83 m)	3/8 (9.5 mm)
2 & 2-1/2 (51 & 64 mm)	10 (3.05 m)	3/8 (9.5 mm)
3 & 4 (76 & 102 mm)	12 (3.66 m)	5/8 (15.8 mm)
6 to 12 (152 to 305 mm)	14 (4.27 m)	7/8 (22.2 mm)
14 to 18 (356 to 457 mm)	20 (6.1 m)	1 (25.4 mm)

B. Install hangers to provide minimum 1/2 inch (12.7 mm) clear space between finished covering and adjacent work.

C. Place a hanger within one foot (0.305 m) of each horizontal elbow.

D. Use hangers which are vertically adjustable 1-1/2 inch (38.1 mm) minimum after piping is erected.

E. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

F. Where practical, support riser piping independently of connected horizontal piping.

3.03 FINISH

A. Finish coat all steel hangers and supports in finished areas to match surrounding area. Prime coat all other steel hangers and supports.

END OF SECTION

SECTION 15250

PIPING INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Field applied insulation for above ground piping.

B. Adhesives, tie wires, tapes.

C. Recovering.

1.02 REFERENCE STANDARDS

A. Federal Specifications (Fed Specs)

L-P-535	Plastic Sheeting (Sheeting): Plastic Strip: Poly (Vinyl Chloride) and Poly (Vinyl Chloride-Vinyl Acetate), Rigid.
HH-B-100	Barrier Material Vapor (For Pipe, Duct and Equipment Thermal Insulation).
HH-I-551	Insulation Block and Boards, Thermal (Cellular Glass).
HH-I-558	Insulation, Blocks, Boards, Blankets, Felts, Sleeving (Pipe and Tube Covering), and Pipe Fitting Covering, Thermal (Mineral Fiber, Industrial Types).
HH-I-573	Insulation, Thermal, (Flexible Unicellular Sheet and Pipe Covering).
HH-I-1751/3A	Insulation Sleeving, Thermal, Pipe Covering (Cellular Glass).
SS-C-160	Cement, Insulation Thermal.

B. Military Specifications (Mil Spec)

MIL-A-3316	Adhesives, Fire-Resistant, Thermal Insulation.
MIL-B-19564	Bedding Compound, Thermal Insulation Pipe Covering.
MIL-C-19565	Coating Compounds, Thermal Insulation Pipe Covering - Fire - and water-resistant, Vapor Barrier and Weather Resistant.
MIL-C-20079	Cloth, Glass; Tape, Textile Glass; and Thread, Glass.
MIL-A-24179	Adhesive, Flexible Unicellular-Plastic Thermal Insulation.
MIL-I-24244	Insulation Materials, Thermal, with Special Corrosion and Chloride Requirements.

MIL-C-82052 Coating, Compound, Waterproofing, Mineral Filled, Solvent-Type, Asphalt Base.

C. American Society for Testing and Materials (ASTM) Publications

A 167 Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

B 209 Aluminum-Alloy Sheet and Plate.

C 195 Mineral Fiber Thermal Insulating Cement.

C 533 Calcium Silicate Block and Pipe Thermal Insulation.

E 84 Surface Burning Characteristics of Building Materials.

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Publication

SP-69 Pipe Hangars and Supports - Selection and Application (1976).

1.03 SURFACE BURNING CHARACTERISTICS

A. Requirements: Insulation materials, adhesives, coatings, and other accessories shall have surface burning characteristics as detemined by ASTM E 84 not to exceed 25 for flame spread and 50 for smoke developed, except for the following materials:

1. Nylon anchors for securing insulation to ducts or equipment.

2. Factory premolded one-piece PVC fitting and valve covers.

3. Weatherproof coating.

4. Asphaltic Mastic.

5. Wood Blocks and wood or cork dowels.

1.04 FLAMEPROOFING

A. Flameproofing treatments subject to deterioration due to the effect of moisture or high humidity are not acceptable.

1.05 SUBMITTALS

A. Submit shop drawings which indicate complete material data, a list of materials proposed for this project and indicate thickness of material for individual services.

1.06 JOB CONDITIONS

A. Deliver material to job site in original nonbroken factory packaging, labeled with manufacturer's density and thickness.

B. Perform work at ambient temperature as recommended by the adhesive manufacturer.

PART 2 - PRODUCTS

2.01 ADHESIVES: MILITARY SPECIFICATION MIL-A-3316, CLASS 1 OR 2 AS SPECIFIED.

2.02 CONTACT ADHESIVE: MILITARY SPECIFICATION MIL-A-24179, TYPE II, CLASS 1.

2.03 ASPHALTIC MASTIC: MILITARY SPECIFICATION MIL-C-82052.

2.04 BANDS.

A. On Aluminum Jacket: 3/8-inch by 0.020-inch and 2-inch by 0.016-inch thick aluminum.

2.05 BEDDING COMPOUND: MILITARY SPECIFICATION MIL-B-19564.

2.06 CORNER ANGLES: MINIMUM 28 GAGE, 1-INCH BY 1-INCH ALUMINUM ADHERED TO 2-INCH HEAVY kraft paper.

2.07 MINERAL FIBER THERMAL INSULATING CEMENT: ASTM C 195.

2.08 GLASS TYPE: MILITARY SPECIFICATION MIL-C-20079, TYPE II, CLASS 1 OR 3. TYPE SHALL BE 4-inch wide rolls. Class 3 shall be 4.5 ounces per square yard.

2.09 GLASS CLOTH: MILITARY SPECIFICATION MIL-C-20079, TYPE I, CLASS 1, UNTREATED.

2.10 INSULATION JACKETS

A. Vapor Barrier Jackets: Vapor barrier jackets used on insulation exposed in finished areas shall have white finish suitable for painting without sizing.

B. Vapor Barrier Jacket for Pipe and Equipment: Federal Specification HH-B-100, Type 1. Factory composite materials may be used to meet Beech puncture units.

C. Aluminum Jacket: Corrugated, embossed or smooth sheet, 0.016-inch nominal thickness; ASTM B 209, Temper H14, Temper H16, Type 3003, 5005, 3105 or 5010. Jackets shall be provided with moisture barrier except when applied over vapor barrier jackets. Corrugations may run longitudinally or circumferentially.

2.11 STAPLES: OUTWARD CLINCHING TYPE, MONEL OR ASTM A 167, TYPE 304 OR 316 STAINLESS steel.

2.12 POLYVINYL CHLORIDE FITTING COVERS: FEDERAL SPECIFICATION L-P-535, COMPOSITION A, Type II.

2.13 VAPOR BARRIER COATING: MILITARY SPECIFICATION MIL-C-19565, TYPE II. COLOR SHALL BE white and qualification for listing is not required.

2.14 WIRE: SOFT ANNEALED GALVANIZED WIRE, 16 GAGE.

2.15 PIPE INSULATION FOR COLD PIPELINES (MINUS 30 DEGREES TO PLUS 60 DEGREES F), AND Domestic Cold Water,

A. Mineral Fiber: Federal Specification HH-I-558, Form D, Type III, Class 12.

NOTE: Service temperature range of minus 40 degrees F to 250 degrees F thickness shall be as required for mineral fiber.

PART 3 - EXECUTION - ABOVEGROUND PIPE INSULATION

3.01 INSTALLATION:

A. Except as specified, material shall be installed in accordance with the recommendations of the manufacturer. Insulation materials shall not be applied until tests specified in other sections of these specifications are completed; foreign material such as rust, scale, or dirt has been removed from surfaces to receive insulation; and the surfaces are clean and dry. Insulation shall be kept clean and dry at all times.

3.02 GENERAL REQUIREMENTS:

A. Cold water piping. Domestic cold and chilled drinking water pipe, makeup water pipe, interior roof drain lines, refrigerant suction lines, chilled water, dual temperature water, air conditioner condensate drain pipelines shall be insulated as specified for cold pipelines as shown in Table I; exterior piping shall be insulated as specified for piping exposed to weather.

B. The following lines shall not be insulated:

1. Pipe used solely for fire protection.

3.03 PIPES PASSING THROUGH SLEEVES AND/OR HANGERS

A. Insulation, whether hot or cold application, shall be continuous through hangers and sleeves.

B. An aluminum jacket shall be provided over the insulation.

C. Where penetrating interior walls, the aluminum jacket shall extend 2 inches beyond either side of the wall and shall be secured on each end with a band.

D. Where penetrating floors, the aluminum jacket shall extend from a point below the backup material to a point 10 inches above the floor with one band at the floor and one not more than 1 inch from the end of the aluminum jacket.

E. Where penetrating exterior walls, the aluminum jacket required for pipe exposed to weather shall continue through the sleeve to a point 2 inches beyond the interior surface of the wall.

F. Support points such as hangers or rollers shall have a galvanized protection shield conforming to MSS SP-69, Type 40.

G. On pipes 2 innches and larger, an insulation insert of a density at least 9 pcf shall be installed under the hanger. The insert shall be the same length as the protection shield and shall cover not less than the bottom 180 degree arc of the pipe. As an option, at least three wood or cork dowels may be used and placed strategically between the pipe and shield on an approximate 180 degree arc. Inserts, blocks or dowels shall be the same thickness as the insulation.

H. Inserts, blocks, or dowels shall be covered with a jacket material of the same appearance and quality as the adjointing pipe insulation jacket, shall overlap the adjoining pipe jacket 1-1/2 inches, and shall be sealed as required for the pipe jacket.

I. A factory fabricated protection shield unit that complies with the requirements specified for individual components may be furnished.

3.04 COLD PIPELINES (MINUS 30 DEGREES TO 60 DEGREES F)

A. Insulation Thickness: Thickness of insulation (in inches) shall be as indicated in Table I.

TABLE I

Service of Range or Temp. (Degrees F)	PIPE SIZE (inches)					
	1/4 to 1-1/4	1-1/2 to 3	3-1/2 to 5	6 to 10	11 to 24	25 to 33
Domestic Cold Water (MF)	0.5	0.5	0.5	1	1	1

NOTES: MF - Mineral Fiber

B. Vapor Barrier Jacket: Pipe insulation shall be covered with a factory applied vapor barrier jacket. Insulation or phenolic foam inside the building shown to be protected with an aluminum jacket shall have the insulation and vapor barrier jacket installed as specified herein. The aluminum jacket shall be installed as specified for pipeing exposed to weather, except sealing of the laps of the aluminum jacket is not required.

C. Cold Pipe Insulation (Straight Runs):

1. Insulation shall be applied to the pipe with joints tightly butted and the ends of the insulation sealed off with Type II vapor barrier coating at intervals not to exceed 15 feet.

2. Longitudinal laps of the jacket material shall overlap not less than 1-1/2 inches. Butt strips 3 inches wide shall be provided for circumferential joints.

3. All laps and butt strips shall be secured with Class 2 adhesive and stapled on 4-inch centers.

4. Factory self-sealing lap systems may be used when the ambient temperature is between 40 degrees and 120 degrees F. The lap system shall be installed in accordance with manufacturer's recommendations. Stapler shall be used only if specifically recommended by the manufacturer. Where fishmouths occur, the section shall be replaced or the fishmouth repaired by applying Class 2 adhesive under the lap and then stapling.

5. Staples and seams, including those on self-sealing lap systems shall be coated with a Type II vapor barrier coating.

6. Breaks and punctures in the jacket material shall be patched by wrapping a strip of jacket material around the pipe and securing it with adhesive, stapling, and coating as specified for butt strips. The patch shall extend not less than 1-1/2 inches past the break.

7. At penetrations such as thermometers, the void in the insulation shall be filled with vapor barrier coating and the penetration shall be sealed with a brush coat of the same coating.

8. Gage piping may be insulated with unicellular plastic insulation.

D. Insulation for Flanges, Unions, Valves, Anchors, Fittings, and Accessories:

1. Pipe insulation shall have ends thoroughly coated with Type II vapor barrier coating not more than 6 inches from each flange, union, valve, anchor or fitting in all directions.

2. Insulation of the same thickness and conductivity as the adjoining pipe insulation (either premolded or segmented) shall be placed around the item, abutting the adjoining pipe insulation. If nesting size insulation is used, the insulation should be overlapped 2 inches or one pipe diameter. Loose fill mineral wool or insulating cement shall be used to fill the voids. Elbows insulated using segments shall not have less than 3 segments per elbow. Insulation may be secured by wire or tape until finish is applied.

3. Upon completion of installation of insulation two coats of Type II vapor barrier coating be applied with glass tape embedded between coats. Tape seams shall overlap 1 inch. The coating shall extend out onto the adjoining pipe insulation 2 inches.

4. Where unions are shown not to be insulated, the insulation shall be tapered to the union at a 45-degree angle. The insulation and jacket shall terminate and shall be sealed with two coats of Type II coating with glass tape embedded between coats.

5. Anchors attached directly to the pipe shall be insulated for a sufficient distance to prevent condensation but not less than 6 inches from the insulation surface.

6. Flexible connections at pumps and other equipment shall be insulated with unicellular plastic insulation, unless otherwise indicated.

E. Optional Poly-Vinyl Chloride Fitting Covers: At the option of the contractor premolded, one-piece polyvinyl chloride (PVC) fitting covers may be used in lieu of the embedded glass tape. Factory premolded insulation or field-fabricated insulation segments shall be used under the fitting covers. Blanket inserts will not be allowed. Insulation shall be covered with 2 or more coats of Type II vapor barrier coating to a minimum thickness of 1/16 inch before the PVC covers are installed. The covers shall be secured by PVC vapor barrier tape or with tacks made for securing PVC covers. All tape seams and tacks shall then be coated with Type II vapor barrier coating. Premolded PVC fitting covers shall not be used where exposed to the weather.

3.05 PIPE EXPOSED TO WEATHER: PIPING EXPOSED TO WEATHER SHALL BE INSULATED AND jacketed as specified for the applicable service, prior to application of the aluminum jacket.

A. An aluminum jacket shall be installed over the insulation. The jacket for hot pipting may be factory applied. The jacket shall overlap not less than 6 inches at longitudinal and circumferential joints and shall be secured with bands at not more than 12-inch centers. Longitudinal joints shall be overlapped down to shed water. Circumferential joints shall be sealed with a coating recommended by the insulation manufacturer for weatherproofing seams and joints in aluminum jackets.

B. Flanges unions, valves, fittings, and accessories shall be insulated and finished as specified for the applicable service. Two coats of an emulsion type weatherproof coating recommended by the insulation manufacturer shall be applied with glass type embedded between coats. Tape overlaps shall be not less than 1 inch and the adjoining aluminum jacket not less than 2 inches. Factory preformed aluminum jackets may be used in lieu of the above.

3.06 FINISH

A. No additional finish is required inside the building, except that were shown insulation shall be protected with field applied aluminum jacket.

END OF SECTION

SECTION 15400

PLUMBING SYSTEMS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Domestic water supply inside building.

B. Valves

1.02 APPLICABLE PUBLICATIONS

A. American Society for Testing and Materials (ASTM):

1.	A 47-74	Malleable Iron Castings
2.	A 120-76	Pipe Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel, for Ordinary Uses
3.	A 183-68	Heat-Treated Carbon Steel Track Bolts and Carbon Steel Nuts
4.	A 333-76a	Seamless and Welded Steel Pipe for Low-Temperature Service

B. American National Standards Institute (ANSI):

1.	B 16.1-1975	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800 Lb
2.	B 16.3-1977	Malleable-Iron Screwed Fittings, 150 and 300 Lb
3.	B 16.4-1977	Cast-Iron Screwed Fittings, 125 and 250 Lb
5.	B 16.5-1977	Steel Pipe Flanges, Flanged Valves and Fittings Including Ratings for Class 150, 300, 400, 600, 900, 1500, and 250
4.	B 16.20-1977	Cast-Iron Threaded Drainage Fittings

C. U.S. Dept. of Commerce, Commerical Standard (CS): CS-188

D. General Services Admin., Public Buildings Service (GSA/PBS)

1.03 SUBMITTALS

Submit shop drawings and product data in accordance with Section 01300.
Submit shop drawings and product data in accordance with Section 01300.

A. Provide Certificate of Acceptability after completion of disinfection of the water system.
B. Welders must be current in their certification for this type of work.

PART 2 - PRODUCTS

2.01 MECHANICAL COUPLINGS

A. Couplings shall be self-centering and shall engage and lock in place the grooved or shouldered pipe and pipe fitting ends in a positive water-tight couple. Fittings shall provide some degree of angular pipe deflection, contraction, and expansion.

B. Coupling housing clamps shall be fabricated in two or more parts of malleable iron castings, ASTM A 47. Housing clamps shall hold in place a composition water-sealing gasket designed so that internal water pressure serves to increase the seal's watertightness.Coupling assembly shall be securely held together by two or more trackhead, square or oval-neck, steel bolts. Bolts and nuts shall be heat treated carbon steel and shall be in accordance with ASTM A 183.

C. Entire coupling installation shall be accomplished in accordance with manufacturer's latest published literature. Pipe sizes 3/4-inch through 24-inch may be cut-grooved or roll-grooved, except that pipe and tubing having wall thicknesses less than the minimum recommended by the manufacturer for cut-grooving shall be roll-grooved without the removal of any metal.

2.02 ABOVEGROUND WATER PIPING

A. Aboveground domestic cold water piping inside the building, 2 inches and larger shall be steel, Schedule 40, ASTM A 120.

B. Couplings shall be of the same material as the pipe.

C. Fittings, other than couplings, shall comply with ASTM B 16.3 or B 16.4.

D. Unions 2-1/2-inch size and larger shall be cast-iron flange unions with 1/16-inch thick rubber gaskets. Flanges shall be 125 p.s.i. class in accordance with ANSI B 16.1.

E. Mechanical couplings to be used on all above ground domestic cold water piping, and may be used to connect mechanical equipment. Fittings with grooved ends for use with mechanical pipe couplings may be used on aboveground ferrous domestic cold water systems only. Mechanical couplings and fittings shall be as herein before specified under "Mechanical Couplings".

2.03 VALVES, COCKS, AND FAUCETS

A. ACCEPTABLE MANUFACTURERS

1. Provide valves of same manufacturer throughout where possible.

2. Provide valves with manufacturer's name and pressure rating clearly marked on outside of body.

B. VALVE CONNECTIONS

1. Provide valves suitable to connect to adjoining piping as specified for pipe joints. Use pipe size valves.

2. Thread pipe sizes 2 inches and smaller.

3. Flange pipe sizes 2-1/2 inches and larger.

4. Use grooved body valves with mechanical grooved jointed piping.

5. Provide Keystone 992 or equivalent butterfly valve with tapped lug body when used for isolating service.

6. Provide dielectric unions when required to prevent disimilar metal corrosion.

C. BUTTERFLY VALVES

1. Iron body, stainless steel disc and shaft, resilient replaceable PTFE Teflon liner seat, and lug type body.

2. Butterfly valves shall be in accordance with Federal Specification WW-V-1967.

D. BALL VALVES

1. Valve bodies shall be constructed of similar metals as the end piping connections.

2. Ball valves shall be in accordance with Federal Specification WW-V-35B or latest revision of WW-V-35.

E. DRAIN VALVES

1. Bronze compression stop with nipple and cap or hose thread.

F. PRESSURE RATINGS

1. Unless otherwise indicated, use valves suitable for 125 minimum psig (862 kPa) WSP and 450 degrees F (232 degrees C) and 200 psig (1379 kPa) and 250 degrees F (121 degrees C).

G. VALVE OPERATORS

1. Provide suitable hand-wheels for butterfly valves.

2. Provide valves located more than 7 feet (2.1 m) from floor in equipment room areas with chain operated sheaves. Extend chains to about 5 feet (1.53 m) above floor and hook to clips arranged to clear walking aisles.

PART 3 - EXECUTION

3.01 WATER PIPING INSTALLATION

A. Water piping shall be complete from service connection to all equipment outlets, etc. Sizes of pipes shall be as shown or specified.

B. Ends of pipes and tubes shall be reamed before being made up.

C. Long screws and bushings (other than bushings cast in the sand) shall not be used on water piping.Ends of tubing and recesses of fittings to be soldered shall be thoroughly cleaned. Joints shall be assembled without binding. Solder shall penetrate fully and shall fill the joint completely.

D. Where non-ferrous metal piping and zinc-coated metal piping are joined, dielectric (insulating) couplings, fittings or unions shall be provided.

E. Branches from water supply mains shall be taken from the top, bottom or side, using crossover fittings where required by structural or operating conditions.

F. Unions shall be installed near points of connections to each piece of equipment, aewhere as required for installation of piping, removal and replacement of regulating and control equipment, etc. Right and left couplings, or nipples are prohibited.

G. Bottom taps shall not be used for anything other than drains.

3.02 VALVES, COCKS, AND FAUCETS INSTALLATION

A. Install valves with stems upright or horizontal, not inverted.

B. Install butterfly valves for shutoff and isolation of service, part of systems or vertical risers.

C. Provide drain valves at main shutoff valves, low points of piping and apparatus.

D. Locate all valves to assure clear access for operation and maintenance.

3.03 TESTING

A. All tests shall be made when there is no danger of freezing, prior to enclosure of any parts of the systems by furrings, suspended ceilings, etc., and prior to the applications of insulation to any joints at fittings, valves, couplings, etc.

B. Where conditions such as pipe tie-ins to existing pipe, building schedules, or occupancy schedules are such as to require the systems to be tested in sections, such tests shall be performed without additional costs to the Government.

C. All tests shall be made in the presence of and results approved by the Contracting Officer or his representative.

D. Should any leaks, flaws, or defective materials or equipment be found during the testing operations, such leaks or flaws shall be corrected, and defective materials and equipment replaced. All defective joints shall be remade and caulking of threaded joints will not be acceptable. After corrections have been made, tests shall be repeated until all systems are proven tight and satisfactory to the Contracting Officer. All corrections and retests shall be made without additional cost to the Government.

3.03 DISINFECTION OF WATER SYSTEM

A. After completion of all tests, replacements and repairs, all new water supply systems and extensions to and repaired sections of existing systems shall be thoroughly flushed with water to remove sediment and then disinfected. The disinfection shall be applied to all cold water piping.

B. The disinfectant shall be chlorine, either in the form of a hypochlorite solution or in the form of compressed gas applied through an approved chlorinator. Refer to AWWA-C651-99, use the slug method.

C. In cases of piping system repair or other emergency, a residual chlorine content of 100 ppm after a retention period of one hour, shall be provided in lieu of the content and retention time specified above.

D. Following disinfection, all treated water shall be flushed from the system through its extremities. Flushing shall continue samples show that the quality of the water delivered is comparable with the quality of the public water supply and satisfactory to the public health authority having jurisdiction. Flushing shall be repeated if samples taken daily over a period of three days show the water quality is not being maintained. Samples shall be taken only from taps located and installed in such a manner that they will not contribute any contamination. Samples shall not be drawn from hydrants or through unsterilized hose. Test samples shall be certified by a recognized and approved testing laboratory, and a certificate of acceptability shall be furnished to the Contracting Officer.

END OF SECTION

APPENDIX

PHOTOGRAPHS

PHOTO - 1

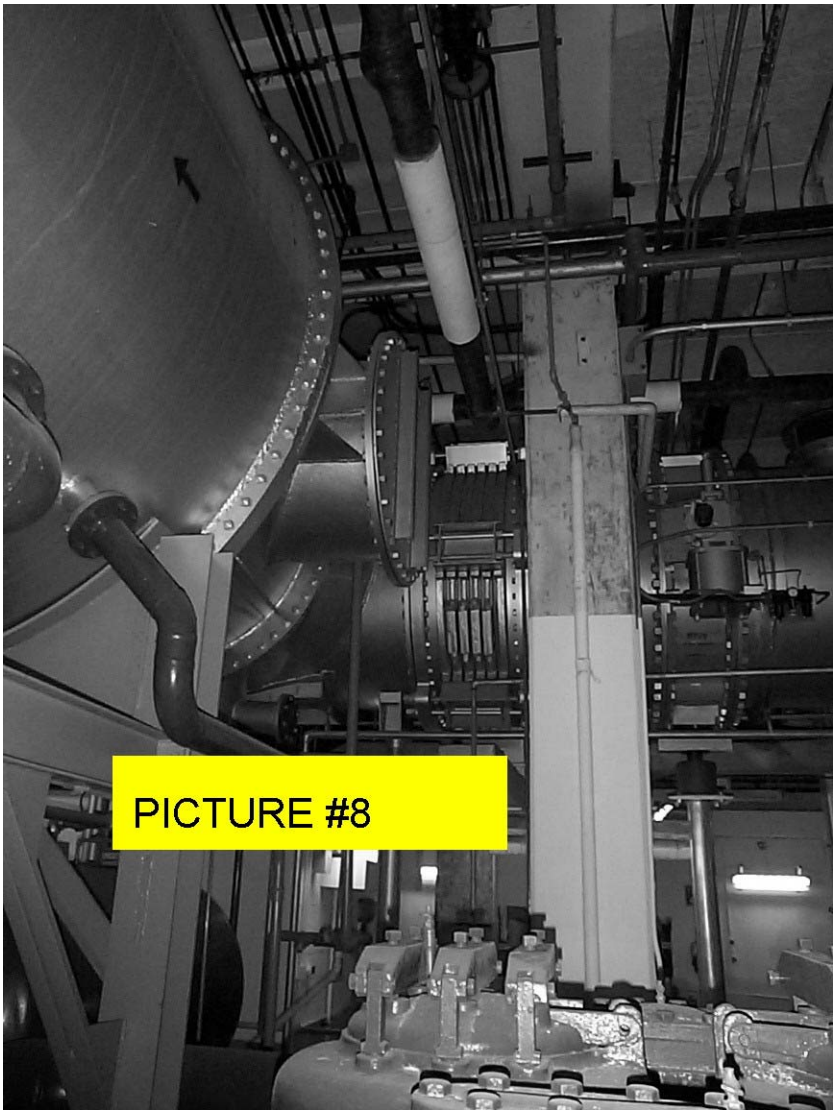
PHOTO - 2

PHOTO - 3

PHOTO - 4

PHOTO - 5

PHOTO - 6



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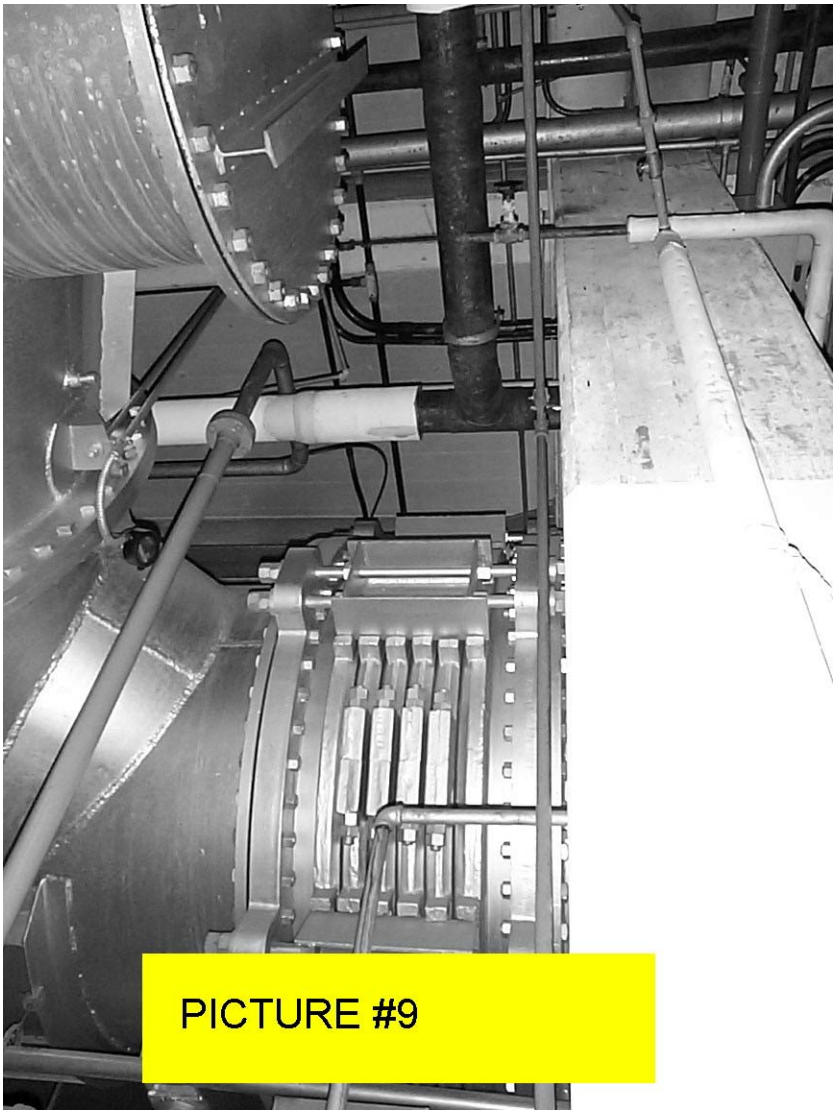

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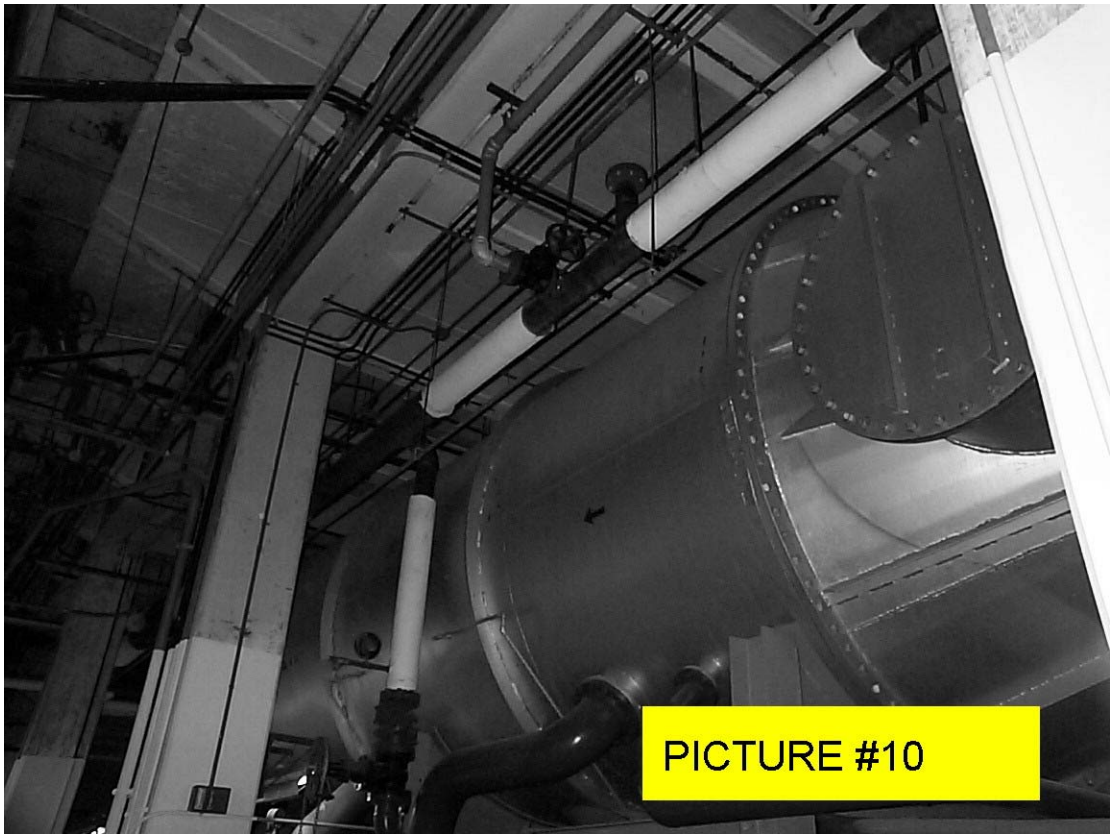

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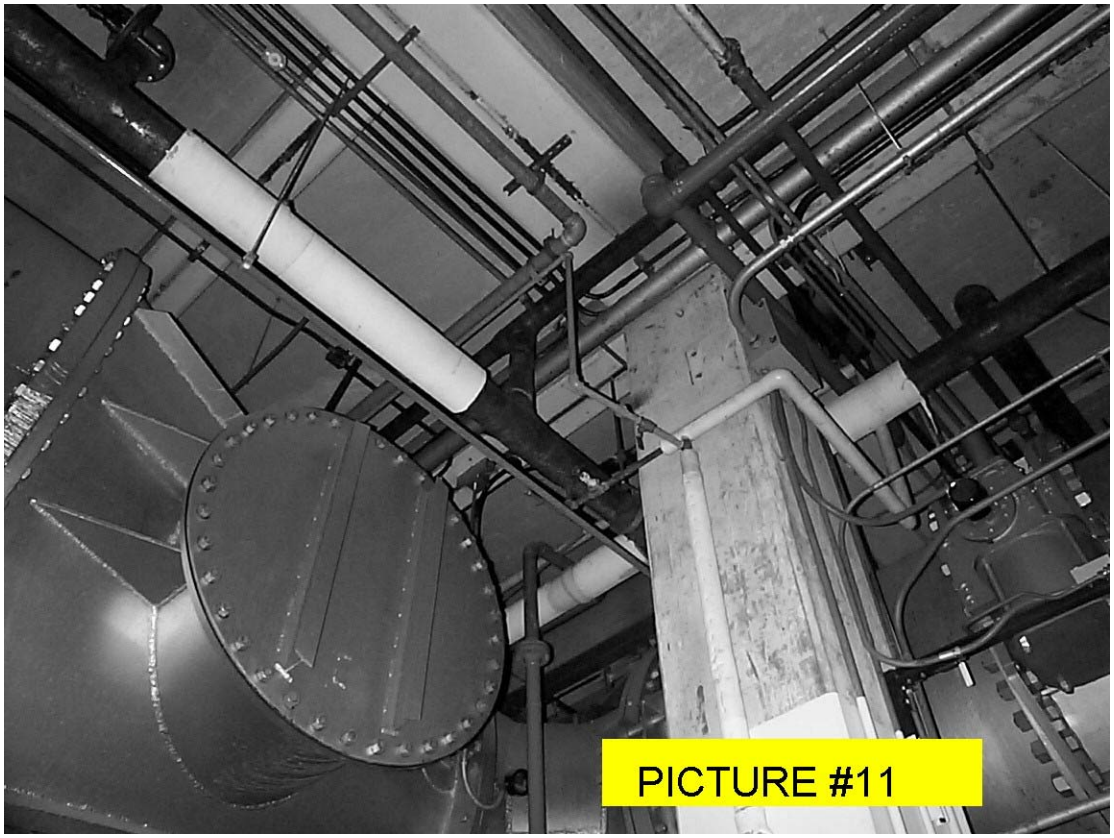

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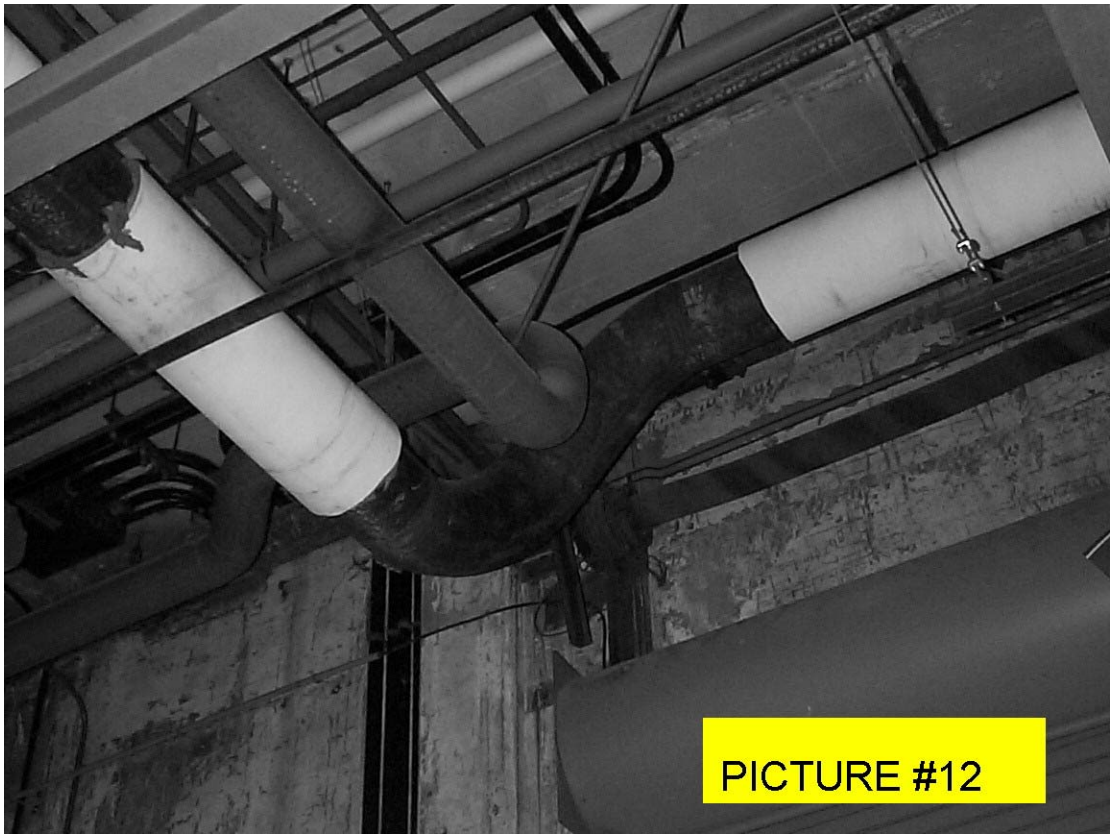

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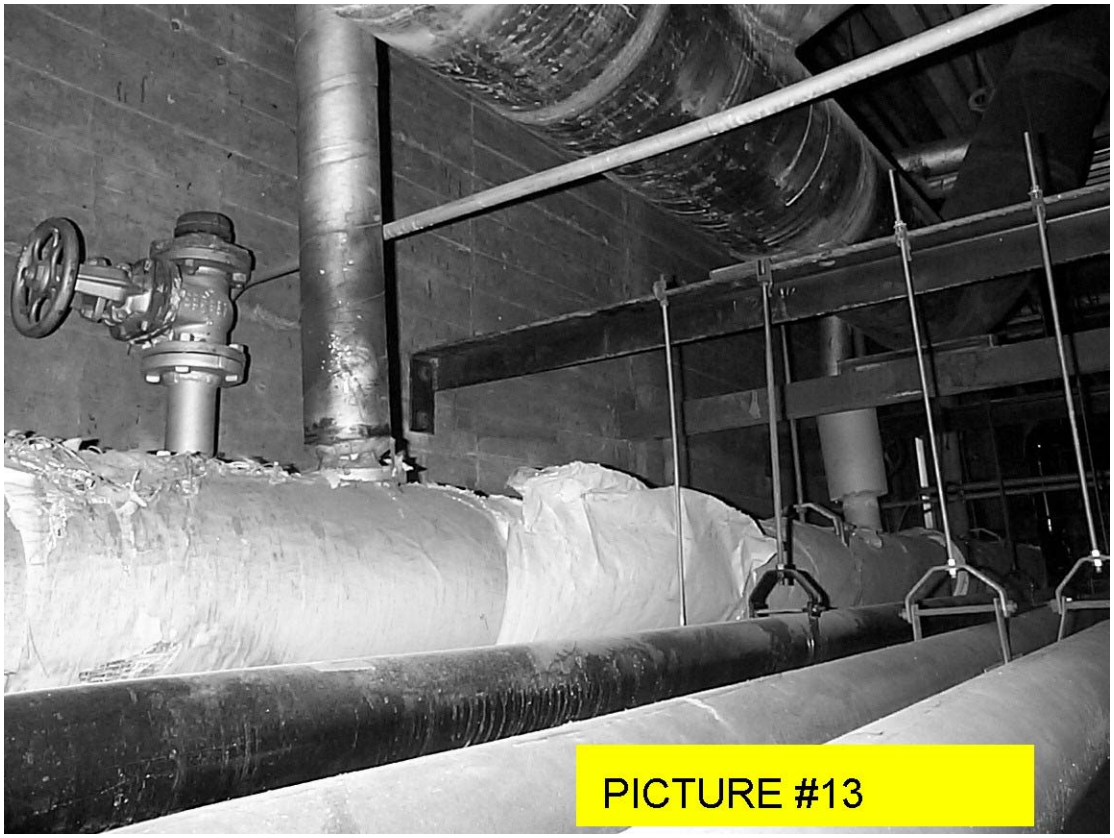

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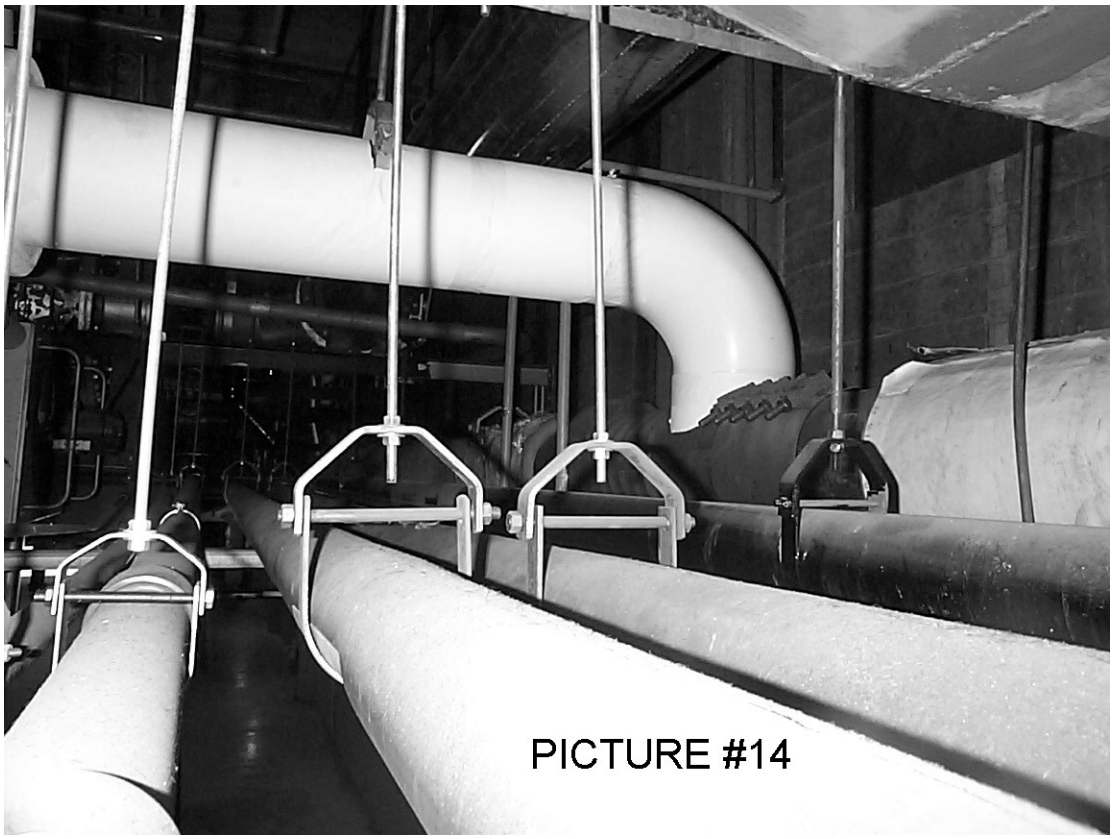

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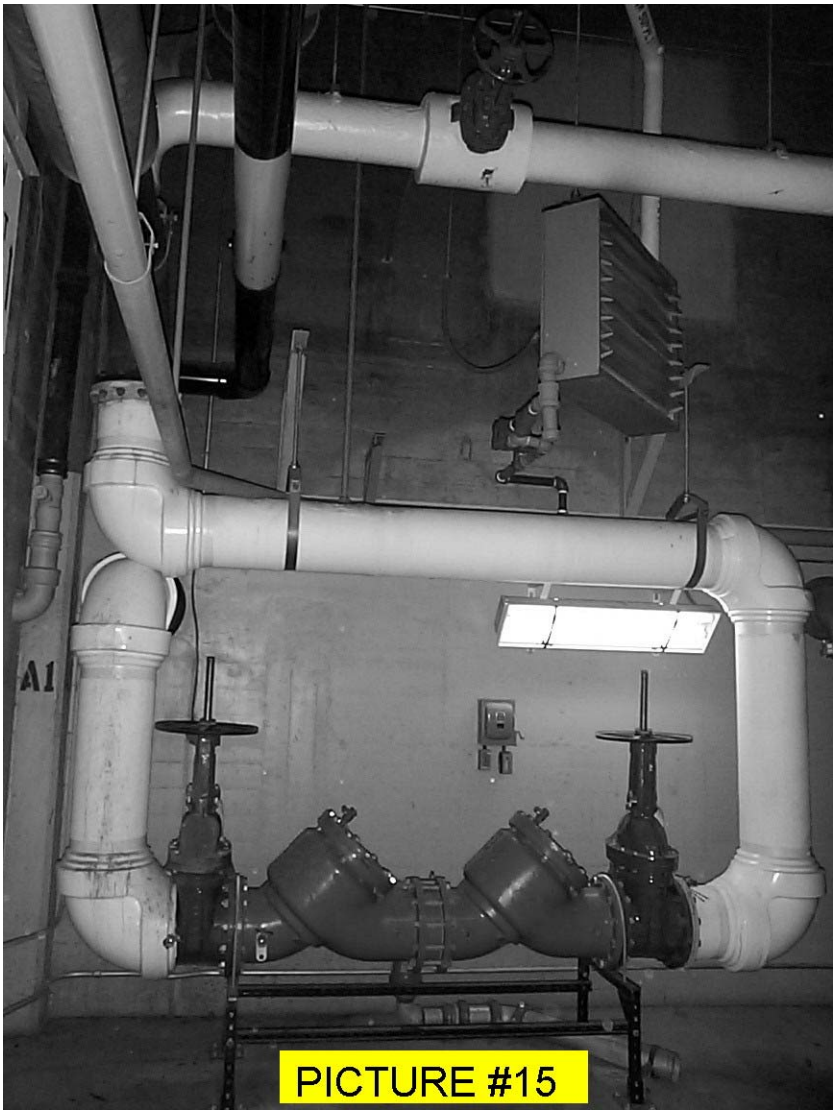

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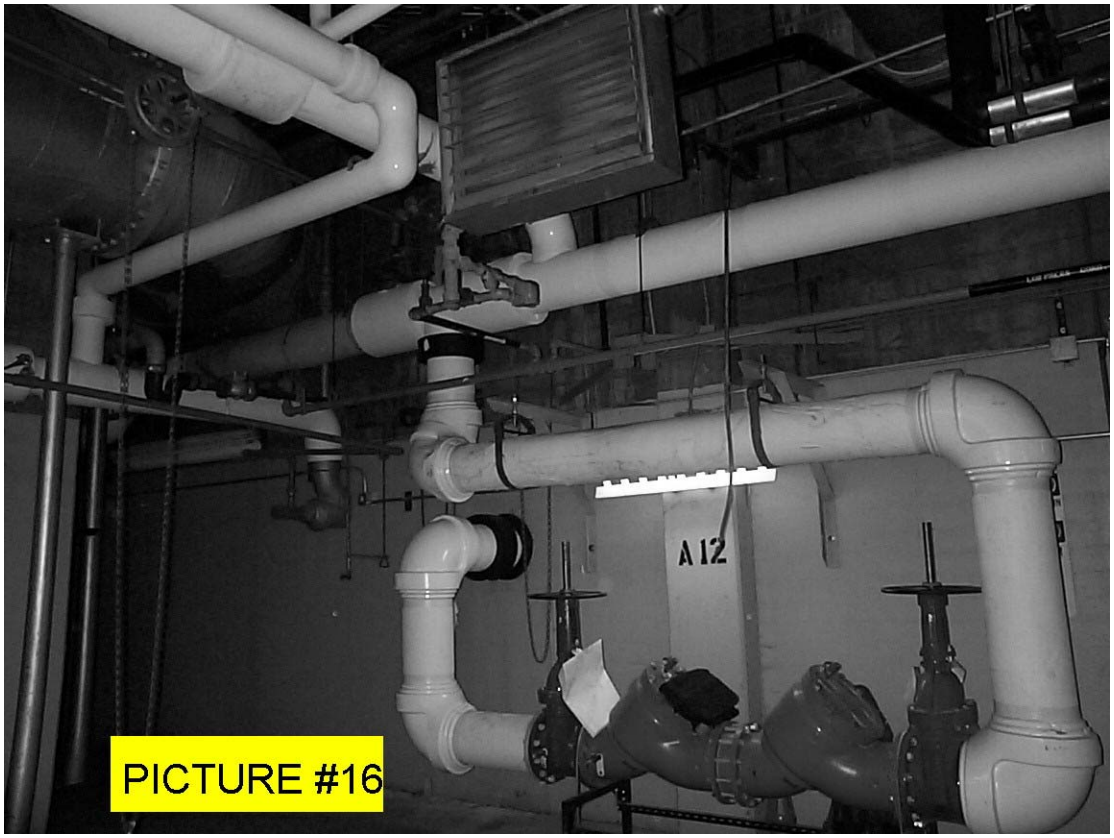

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